PART

1

Clean Air Strategy for Alberta

Report on the Regional Sessions

Volume III: *Written Submissions*
Part One

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This document is Volume III, part one, of the *Report on the Regional Sessions*. Volume I is the *Moderator's Report*. Volume II is the *Verbatim Transcript* of the public meetings. Volume III, parts one and two, are the *Written Submissions*. Part one is submissions from governments, industry and individuals and part two is from public interest groups and schools. Volume I has wide distribution and may be obtained at the address below. Volumes II and III, parts one and two, are on file at many public libraries for public access and for inter-library loan.

ISBN 0-86499-832-5
Pub. No. I/418
1990-91

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January 14, 1991

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Please find enclosed the written submission on the Clean Air Strategy for Alberta, from Grant Mitchell, MLA and Nick Taylor, MLA. The Liberal Caucus looks forward to seeing the Clean Air Strategy drawn up and implemented as soon as possible.

Yours truly,

M. Griffiths

Mary Griffiths
Researcher

CLEAN AIR STRATEGY FOR ALBERTA

PROPOSALS BY GRANT MITCHELL, MLA

LIBERAL ENVIRONMENT CRITIC

AND

NICK TAYLOR, MLA

LIBERAL UTILITIES CRITIC

January 14, 1991

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1. Introduction

It is important that Alberta develop a Clean Air Strategy, because of global warming, acid deposition and smog caused by burning fossil fuels and the effects these have on human health and life.

Albertans should be especially concerned about the contribution that the province makes to global warming. Although the province has only 0.04% of the world's population we produce about 0.5% of the energy-related carbon dioxide (CO_2) in the world, due to our use of fossil fuels. While a considerable amount of this is due to energy exported to other provinces and states, Alberta has both a moral obligation and an economic incentive to deal with the emissions of CO_2. On the one hand, we have a moral obligation because we have a highly sophisticated, well-educated society that can provide leadership and put us in a strong position to help reduce these emissions, ultimately world-wide. On the other hand, we have a huge economic stake in the burning of fossil fuels, and are therefore extremely vulnerable should world markets shift their demand for fossil fuels out of fear for CO_2 emissions. We must focus our attention of ways of conserving energy, developing non-polluting energy and creating technology that reduces or captures CO_2. By being at the forefront in the field of emission-reduction technologies, and various other initiatives to reduce greenhouse gases, the province can build a more diversified and less vulnerable economy and develop technology that we can sell around the world.

The government's "Clean Air Strategy for Alberta" is concerned with energy-related air emissions. However, air pollution is caused not only by burning fossil fuels but by various non-energy sources such as industrial plants and incinerators. The scope of the Clean Air Strategy should be broadened to cover non-energy air emissions, some of which will be mentioned below.

It is important that the Clean Air Strategy is pro-active, and is designed not only to reduce emissions which are currently of concern, but framed to reduce emissions of various trace elements and other substances. The long term plan should be to eliminate emissions of all substances unless it has been shown that they are harmless.

The public input into the initial phase of the Clean Air Strategy would have been much more productive if the government had outlined a draft strategy for reducing emissions. The documents published in the information package are informative, but give no indication of the actual measures which the government might take. Although some stakeholders may welcome a "carte blanche" to enable them an opportunity to express their vested interests, workshops and public input would have been more productive if participants were able to criticise or make recommendations within the structured framework of a draft government strategy.

The following issues should be given consideration when drawing up the Clean Air Strategy.

2. The Clean Air Strategy and Health

The fundamental reason for introducing a Clean Air Strategy is to protect not only the environment but human health. Traditionally the Department of Environment has been responsible for establishing acceptable standards for air pollution. It is, however, essential that health experts should also be involved, to ensure that emission levels will be strict enough to adequately protect human health.

The Clean Air Strategy should incorporate a definition of health, to provide a standard of what is acceptable. The definition given by the World Health Organization, in the preamble to its constitution, is recommended. It states that health is "A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

3. Greenhouse gases

The Intergovernmental Panel on Climatic Change has provided definite evidence that the quantities of CO_2 and other greenhouse gases are increasing and that the world is becoming warmer. This United Nations Panel predicts that, based on current model results, continuing with the current "business as usual" policy "will result in a likely increase in the global mean temperature of about $1^{0}C$ above the present value by 2025."[1] As an industrialised country Canada produces more gases that lead to global warming per head of population than most other countries and Alberta produces about 22% of energy-related CO_2 emissions in Canada. Alberta should accept responsibility for reducing its share of greenhouse gases and the province must reduce not only levels of CO_2 but also those of other "greenhouse gases" including chlorofluorocarbons, nitrogen oxides (NO_x) and volatile organic compounds (VOC).

3.1 Carbon dioxide

The province should aim to reduce CO_2 emissions to 20% below the 1988 level by the year 2005 (the objective proposed by the World Conference on the Changing Atmosphere[2]).

Alberta should only be directly responsible for emissions of CO_2 produced from fossil fuels consumed within the province, and should lobby the federal government to set up a nation-wide scheme which would make other provinces responsible for their share of the emissions. This could be done under an apportionment system, using tradable pollution credits, that would allow Alberta to "trade" emissions with other parts of the country. Each province would be allowed to produce a certain amount of CO_2, but if a province wanted to buy some of their fossil-fuel-based energy from Alberta, they would have to give Alberta a share of their pollution allowance. Country-wide emissions of CO_2 would continuously be cut back, by reducing the total allowable emissions each year. Thus, each province would have an incentive to help Alberta reduce its emissions by sharing the cost of reducing CO_2 emissions from Alberta-produced fossil fuels that they consume.

There are a wide variety of energy conservation methods for reducing CO_2 emissions in Alberta, but even if all conservation measures examined by the authors of the Alberta Energy Discussion Paper[3] are carried out, the level of emissions in the year 2005 will only be 7% lower than the level in 1988. It will thus be necessary to identify further methods for reducing CO_2 emissions and to consider far-reaching changes, that may involve changes in lifestyle. One aspect of the Clean Air Strategy must be to examine ways to improve urban planning and the transportation system to encourage the use of energy-efficient forms of transport. A list of recommendations is included in "Clouds of Change", the Final Report of the City of Vancouver Task Force on Atmospheric Change.

Various specific methods for reducing the discharge of CO_2 have been outlined in an AOSTRA paper, "The Greenhouse Effect and the Alberta Fossil Fuels Industry" [4]. All six methods which they propose for reducing CO_2 emissions should be adopted, with the most cost-effective measures being introduced first.

3.1.1 Increasing energy efficiency

Energy conservation (e.g. reducing energy consumption by improving insulation and eliminating draughts; using public transport instead of private vehicles) and increasing energy efficiency (e.g. using better-designed, more energy-efficient vehicles, furnaces and appliances) are two important cost-effective ways to reduce the discharges of air pollutants. Measures to encourage energy conservation and energy efficiency should be an integral part of the clean air strategy.

A vehicle registration tax, which penalizes those who buy new vehicles which have a high gas consumption and provides a rebate to vehicles that have low gas consumption should be introduced. This should be phased in by not later than the middle of this decade. Revenue from this tax could also be used to finance a scheme to provide subsidies for the conversion of vehicles to alternative fuels.

Consideration could be given to a scheme such as the Drive + (Demand-based Reductions in Vehicle Emissions) program which has been devised in California[5]. A new vehicle buyer would receive a rebate if the emissions from that model are below the average certified emission standards for all cars sold in the province. This would be paid for by a surcharge on all those cars sold which produce emissions exceeding the provincial average.

The provincial government should cooperate with the federal government to set standards to limit the CO_2 emission from new cars. They should also encourage and undertake research into new, highly efficient urban vehicles powered by hydrogen or other alternative fuels.

Government policy should encourage the co-generation of power. This power can either be used at source or be added to the electricity grid. Utilization of waste heat (e.g. from power stations) should also be developed, for example for district heating.

Stringent energy-conservation building standards should be compulsory for all new buildings, whether residential, commercial or industrial (e.g. requiring that all new residential and commercial buildings are built to at least R-2000 standards, so that they require only 30% of the energy needed to heat conventional buildings). Home-buyers must be encouraged to consider energy efficiency when buying a home and to invest in insulation of existing properties.

Retrofit energy conservation measures would account for about 56% of energy savings between 1988 and 2005 according to an Alberta Energy analysis[3], and although the capital cost would be high, the average payback on investment would be little over 3 years.

The government should thus undertake a public education campaign to stimulate conservation and encourage the installation of the most energy-efficient equipment. If efficient technologies are to be widely deployed, the government or public utilities will need to offer rebate programs to promote the buying of energy-efficient devices (as is already done by more than 60 utilities in the U.S.[6]).

One word of warning is necessary concerning efforts to increase energy conservation. As residential, commercial and institutional facilities increase energy conservation through restricting indoor/outdoor air circulation (measures such as improving air tightness, weather stripping, caulking, air vapour seals), there is a danger of increasing the problem of "Indoor Air Pollution." The number of complaints about indoor air climates have increased during the last decade and the World Health Organization has termed this problem the "Sick Building Syndrome".

Therefore, the Alberta Clean Air Strategy should draw attention to this hazard when making recommendations on improving energy conservation by the above means. Otherwise we may be solving one problem but creating another due to people being exposed to contaminated indoor air (which will result in extra medical expenses, lost man-hours of work, decreased productivity).

3.1.2 Fuel substitution

This involves increasing the hydrogen to carbon ratio of fuels, so that the amount of CO_2 emitted for given energy production is reduced. Using natural gas instead of coal halves the amount of CO_2 produced for a given amount of energy. Propane produces less CO_2 than petroleum gas. The government should start by converting its own vehicles to run on propane or liquid natural gas. This not only reduces air pollution, there is also an economic incentive, as this conversion pays for itself in less than 2 years. Consideration should be given to providing loans or subsidies to encourage vehicle conversion.

Efforts should also be made to increase the percentage of ethanol in gasoline, and to encourage petroleum companies to carry ethanol as a retail product. Ethanol, besides being more environmentally friendly, is also a renewal resource, unlike petroleum products. The use of ethanol on a large scale would also benefit the agricultural sector of Alberta by providing farmers with another market for their grain products.

3.1.3 Reducing CO_2 emissions during production and processing of the fuel

The above-mentioned AOSTRA publication[4] outlines various ways in which this can be done, and the most cost-effective methods should be introduced immediately.

Twenty-five percent of CO_2 emissions from the energy industry come from the oil sands[7]. The CO_2 emissions from the energy sector are expected to grow by over 50% by 2005, largely due to the forecast growth in the oil sands sector. If the government is serious about its Clean Air Strategy, it should not allow the project to go ahead until all air pollution aspects have been resolved. As an interim measure it could be required that each new oil sand plant that comes on stream should have only half the pollution level (per volume of output) compared with the previous plant.

3.1.4 Capturing the CO_2 emissions from fuel combustion

CO_2 can be removed from plants such as coal-fired electricity stations. It is especially important to either reduce or collect CO_2 emissions caused by the generation of electricity as this source contributes nearly one third of the CO_2 produced in the province.

There is a potential to increase the use of CO_2 for the secondary extraction of oil, but this would not utilize all the CO_2 extracted from fuel combustion and other plants. Research is being carried out into ways of storing unwanted CO_2 underground. According to E.J. Wiggins of AOSTRA (personal communication) there is ample scope for such storage, not only in space made available by the extraction of oil or natural gas but in various basins in the western sedimentary strata.

Full support should be given to the current research into extracting and storing CO_2. Inevitably this method of reducing CO_2 emissions will be expensive, but the costs of inaction on global warming may be even higher. Moreover, the consumer will not necessarily face higher electricity costs if full energy-efficiency and conservation measures are adopted.

3.1.5 Tree planting

A provincial tree planting program (perhaps in addition to that proposed by the federal Green Plan) can be a useful means of reducing ambient CO_2 concentrations. In order to reduce annual fluctuations it may be beneficial to plant coniferous rather than deciduous species. It is obvious that with the expansion of the pulp and paper industry and increased logging in northern Alberta, it is essential that replacement planting should at least equal the rate of consumption of old forests.

3.1.6 CO_2 from non-energy sources

CO_2 is also produced from non-energy sources in, for example, the manufacture of nitrogen fertilizer, lime and Portland cement. The scope of the Clean Air Strategy should be extended to enable it take action to reduce CO_2 emissions from such non-energy sources.

3.2 Chlorofluorocarbons

The federal government already has a policy to reduce CFC's, but there is considerable scope for the provincial government. It should be obligatory to collect and recycle or destroy all CFC's from, for example, car air conditioning systems and refrigerators when these are repaired or scrapped. A suitable scheme should be implemented within a year of the introduction of the Alberta Clean Air Strategy.

3.3 Nitrogen oxides and volatile organic compounds

These gases are of concern because at ground level they react with sunlight to form ground level ozone, the third most important contributor to the greenhouse effect.

The provincial government should adopt all measures proposed in the Federal/Provincial Management Plan for Nitrogen Oxides and Volatile Organic Compounds[8]. The province should not be allowed to "water down" any of the regional recommendations, but should start with the most cost-effective.

One of the most cost-effective ways to reduce NO_x and VOC emissions is to undertake a massive energy conservation program (such as is proposed above for reducing CO_2 emissions).

The various methods proposed above to reduce the consumption of conventional fuels used in transportation will also reduce the NO_x and VOC emissions. The province should encourage the federal government to require improved vehicle standards for all new vehicles.

The Clean Air Strategy should be extended to encourage action to reduce VOC emissions from the non-energy sector (e.g. industrial processes in the petrochemical industry).

3.4 Alternative sources of energy

The potential for developing alternative sources of non-polluting energy, such as wind power and solar energy is already being investigated, but more research and development funds should be channelled in this direction. It should be made as easy as possible for small scale suppliers of energy from alternative sources to contribute to the electricity grid. There should also be a "clean air" bonus, as an incentive to those supplying energy by means which do not create pollution, e.g. wind and solar energy.

Research should be encouraged into various types of photovoltaic cells, and non-polluting technologies to produce hydrogen electrolytically. In the long term hydrogen could be a valuable, clean fuel, especially valued as it produces no CO_2, SO_2 or particulate matter.

By encouraging research in alternative energy resources, Alberta could be in the lead with such technologies. We will then not only reduce our own CO_2 emissions, but will be in a position to "export" this knowledge, which will help reduce the impact of any reduction in demand for fossil fuels.

4. Sulphur dioxide

4.1 Sulphur dioxide emissions and health

There is considerable concern about the level of sulphur emissions in the province, and the impact that these can have on health. The most evident source of sulphur dioxide (SO_2) emissions is from the sour gas processing. Although this industry has made major reductions in sulphur emissions, there is still serious cause for concern.

Despite the apparent clear blue skies and clean air in Alberta, the province has the highest asthma rate in Canada. This may not only be a function of emissions, but due to the interaction of particulates and gases. Professor W.C. Hulbert of the University of Alberta Department of Medicine, Pulmonary Defense Group, has pointed out that there is an interactive effect between the concentration of dust particles and SO_2; the health effects of inhaling SO_2 are much greater when particulate levels are high.

Hulbert has drawn attention to information from the Strathcona Air Quality Network[9] which indicates that levels of SO_2 and particulate matter are approaching the threshold where human health could be affected (personal communication). During the summer months suspended particulate levels (resulting from farming activities etc.) exceed the standard of 100 $\mu g/m^3$ by up to a factor of 2. Health problems can result when these high particulate levels combine with either high SO_2 levels or a change in SO_2 levels of more than 25 ppb. In 1989 the maximum levels of SO_2 recorded by the Strathcona Air Quality Network did not occur in the months with high particulate levels, but the levels are sufficient to warrant vigilance. It is probably not possible to reduce particulate levels so efforts should be made to ensure that SO_2 levels are restrained. (See Hulbert's paper[10] for more specific information on this subject.)

Standards for the emission of particulates should aim to reduce the concentration of the smaller particles (less than 2.5 μm in size), as these are the particles that get into the lungs.

4.2 Monitoring

One of the key recommendations of the Alberta Acid Deposition Research Program Advisory Board was that the province should establish a long-term regional air quality monitoring program for the entire province. Obviously this program should not be restricted to monitoring SO_2 and particulate matter but should include a full range of chemical substances released by industrial processes and all forms of fuel combustion, including that from vehicles. The air quality in the main cities and areas of industrial pollution should be announced on the radio each day, and should be accompanied by an assessment of the risk to human health.

Findings on the effect of sulphur emissions on health in Pincher Creek, suggested that chronic low-level exposure to emissions from sour gas plants is sufficient to cause respiratory symptoms among children, even though there is no physiologic change[11]. We also need to know the frequency and severity of any acute effects caused by emissions from such plants.

4.3 Airsheds

Traditional policy has aimed at limiting emissions of undesirable substances from each plant. However, with an increasing number of plants, ambient concentrations can become unacceptably high. Modern meteorology recognizes that air flows in streams, rather like water, so one can have airsheds, which resemble watersheds. One gets a zone of contamination downwind of pollution sources.

The airshed approach to air pollution is a flexible system that allows some variation in emission standards between different industrial plants, while ensuring that total emissions do not pose a threat to human health. The government should investigate ways of introducing the airshed concept for controlling total ambient air pollution levels in certain regions of Alberta where air quality is a cause for concern. The government would set an upper limit on a particular air pollutant within the airshed and each source would be required by a specific deadline to achieve emission reductions equivalent to the amount by which they exceed the government-established baseline figure. If a company wants to exceed this baseline permit level or wants to set up a new plant within an airshed, it would have to buy or trade for a permit from another company, whose emissions are below the baseline standard. The maximum level of emissions permitted within the airshed would be regularly reduced, leading to cleaner air for the entire airshed.

In areas with, for example, a large number of natural gas refineries airsheds should be established which specify the total permissible ambient concentration of total reduced sulphur (SO_2, H_2S and mercaptans), and total particulate matter. However, the airshed concept can obviously be applied for all industrial emissions, not only sulphur.

4.4 Sulphur recovery

Every effort should be made to eliminate sulphur emissions. Currently, the proportion of sulphur recovered from sour gas plants decreases with plant size and only 70% is recovered from small plants producing less than 5 tonnes/day compared with a recovery rate of 99.8% for a plant of 2000 of tonnes/day. Consequently tonnes of SO_2 are currently emitted to the atmosphere, which could be recovered with the best available technology and increases in the recovery rates of sulphur for various plant sizes.

The Alberta Clean Air Strategy should require that the best available technology be used for all plants. It is recognised that it is not economically viable to recover sulphur from small plants, so the government's subsidy scheme (currently available for plants producing between 1 and 5 tonnes per day) should be extended to include those plants producing less than a tonne per day. If necessary, the largest plants covered by the current scheme could be exempted from the subsidy, so that the total government costs for this measure are not increased.

5. Air pollution from non-energy sources

5.1 Biomedical waste and other uncontrolled incinerators

There are approximately 147 small rural biomedical waste incinerators in Alberta, which lack air pollution control devices such as wet/dry scrubbers. Biomedical waste incinerators emit a broad range of contaminants (such as halogenated organic acids, benzene, NO_x, SO_2, hydrogen chloride, chlorine, polychlorinated PAC's, benzo(a)pyrene, particulate matter, lead, cadmium, mercury, and various isomers of dioxins and furans).

On an individual basis, biomedical waste incinerators may not have a large impact on residential airsheds, but the synergistic effect of 147 biomedical waste incinerators on air quality is undoubtedly an environmental health concern.

In California biomedical waste incinerators were given the highest priority for development of dioxin control measures based on emission and exposure potential as:

i. Biomedical waste incinerators have the potential for the greatest individual risk of all sources of dioxins currently identified.

ii. Most of the incinerators are uncontrolled and located in residential areas.

iii. Biomedical waste incinerators are the only known, consistent source of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) in California.

Due to the above, the Canadian Council of Resources and Environment Ministers Committee has specifically endorsed a ban on new small scale, residential, commercial and institutional incinerators that are not capable of meeting minimum combustion requirements outlined in their guideline.

The Alberta Clean Air Strategy should thus adopt the policy of the gradual closure of all uncontrolled biomedical and municipal waste incinerators (including school incinerators that burn plastics), or the upgrading of the air pollution control systems on these incinerators to meet the guidelines put forward by the Canadian Council of Resources and Environment Ministers on Incineration and Municipal Solid Waste Disposal (October 1988).

5.2 Pulp Mills and Waste Systems

Attention should also be paid to monitoring and, if necessary, reducing volatile emissions from the handling of industrial wastes and sludge ponds (e.g. municipal sewer treatment plants, pulp mill sludge ponds, and landfills).

A study of the license to operate for a pulp mill (e.g. Daishowa Canada Co. Ltd. at Peace River) indicates that the ambient air quality of the region will be decreased by particulate emission, SO_2 and total released sulphur emission. As development increases in northern Alberta, the airsheds in the region will probably suffer a deleterious effect due to the pulp mill development. The implications of SO_2 and particulate emissions have already been discussed above.

Thus the Clean Air Strategy should come to a definite decision as to which type of air pollution control technology (Best Practical or Best Available) will be used by northern pulp and paper mills. The type of air control technology chosen will certainly have an effect on the amount of SO_2, particulate and total reduced sulphur emissions released into the atmosphere.

6. Pro-active approach

In the past we have always awaited a pollution problem before taking measures to clean it up. We are becoming increasingly aware that even small quantities of some substances can have detrimental effects on the environment and health. Today we recognize that sulphur and particulate matter can be harmful but this was not known 50 years ago. Some trace elements may have harmful effects of which we are not yet aware. Thus one element of the Clean Air Strategy should be concerned with identifying substances, including trace elements, which are potentially harmful, but which are not currently regulated. Moreover, the onus of proof should be on the industrialist to provide evidence that substances are harmless, before they can be discharged. Modern plants, such as oil upgraders, are so large that even if the proportion of some trace substances is very small, the total emission may be a cause for concern. If we can trap CO_2 and store it underground, we should find ways of trapping and storing trace elements such as cadmium, cesium, lead and mercury.

Efforts are being made to reduce and eliminate liquid effluents (e.g. zero-effluent pulp mills are now being built) and we should likewise plan towards a stackless society, with no emissions of toxic products to the atmosphere.

7. Government standards and regulations

Standards for all mobile and stationary engines, and for industrial plants (both energy-related emissions and emissions from other sources) should be set in regulations which are reviewed every 3 years to ensure that the best available technology is used. In some cases annual revision is probably desirable.

Industry should be required to upgrade and use the latest available technology whenever a license is renewed.

As indicated above, the government should adopt a tax system to encourage the use of small motor vehicles, rather than those which have a high gas consumption.

Regular vehicle testing should be required, to ensure that engines create as little air pollution as possible.

Airsheds should be established, within which a cap is put on further emissions of, for example, total sulphur.

A system of tradable emission permits should be considered as an economic way of encouraging industry to reduce emissions.

8. Conclusion

A Clean Air Strategy for Alberta is overdue. It should cover not only energy related emissions but other aspects of air pollution which are of concern in the province. Because there was no draft strategy for discussion at the initial workshop or regional sessions, it is essential that there should be adequate opportunity for public input in Phase 3, the Summary Workshop. The Final Report should be as specific as possible, and each recommendation should include a specific strategy and time-frame for its implementation.

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Dear Mr. Mitchell:

Thank you for the opportunity to participate in the Clean Air Strategy for Alberta. Our response focuses on the question "What should Albertans do to reduce emissions from energy related sources?".

In 1983, the CRPC published a document entitled Land Use Planning for Energy Conservation: Concepts for Community Planning. As energy conservation also reduces the volume of emissions contributing to smog, acid deposition and greenhouse gases, some of the concepts included in that report are applicable to the clean air issue. The CRPC response, therefore, focuses on the second question outlined above.

Land use planning can contribute to the effort to reduce emissions caused by energy use and production in the following ways:

1. An efficient transportation system, including alternatives to the private automobile, urban centres that provide as many services as possible to the local community, and concentrated forms of development help to reduce energy use for transportation.

2. Higher density residential development helps to reduce urban sprawl and improve the efficiency of public transit. In addition if higher densities are achieved by building dwellings with shared walls, energy use for home heating can be reduced.

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3. Provision of safe pedestrian and bicycle routes connecting various destinations would encourage transportation alternatives.

4. Industrial and commercial waste heat can be used by neighbouring buildings.

5. Subdivisions can be designed so that houses can be oriented toward the sun, to make use of passive solar energy.

6. Buildings can be designed to maximize exposure to the sun, through appropriate siting and landscaping, south facing glass, and other design features.

Regional plans and municipal statutory plans and land use by-laws have an important role to play, first to ensure that they do not impede planning for energy conservation and reduction of emissions, and second to encourage consideration of these issues when land use planning decisions are being made.

We hope you will consider these comments in formulating the clean air strategy for the province.

Yours truly,

Michele Broadhurst

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MB/jm

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TO WHOM IT MAY CONCERN:

Re: Clean Air Strategy

On behalf of the Crowsnest Pass Economic Development Board, I wish to make a few observations and suggestions which I feel must be considered throughout this process.

All of us are concerned about the environment and as parents and grand-parents we know that what we destroy, the next generation will not have to enjoy. Equally important, we cannot set unreasonable levels of regulations, restrictions, bureaucracy, incumbencies so that industry look at Alberta and say "they are a closed shop". We would not be doing our children a favour to tell them that we have looked after the environment so well that Alberta is a good place to own a cottage but live somewhere else to make a living. I feel that we already have more than enough government departments and regulations.

At present there is a Minister's Council on Local Development going around the province attempting to determine what can be done for rural Alberta. The declining population in rural Alberta is playing out a bleak scenario - many of our communities and the people within them have lost their life savings and future. Overly zealous rules result in industry looking at other avenues. Remember: employment is directly proportional to population increase or decrease. If people are leaving your community it normally means there are no jobs available locally.

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The Local Development Initiative is trying to find ways to encourage business to move to rural Alberta. We feel that there is room for both industry and clean air. The present regulation must be enforced but must be fair to the industry also.

My estimation is that approximately 60 percent of our population in the Crowsnest Pass is employed in the energy sector so you can see the concern of our board with this subject.

Thank you for this opportunity to address you this evening. I trust that the recommendations which result from this process will have an even balance.

Sincerely,

C.K. (Cliff) Reiling
Crowsnest Pass Economic
Development Coordinator

CR/ck

MUNICIPALITY OF CROWSNEST PASS

P.O. BOX 370
COLEMAN, ALBERTA
T0K 0M0
PHONE 1-403-562-8836

December 13, 1990

SUBMISSION TO THE CLEAN AIR STRATEGY FOR ALBERTA

The Municipality of Crowsnest Pass appreciates the opportunity to present some of our concerns with respect to development of a clean air strategy. Indeed, air quality is a matter of great concern to all of us, and we recognize the traditional aphorism that "we foul our nests at our own peril".

Most of us are aware of concerns regarding the effects of burning fossil fuels and of deforestation. Acid rain and the death of over two thousand (2,000) lakes in the east is a sin. The loss of great areas of rain forest such as is occurring presently in Brazil is of great concern. We wonder about the hole in the ozone layer but at the same time note that such holes have probably occurred before and that the present hole now appears to be closing. We also wonder about global warming although again one must recognize that significant global temperature variations have occurred in the past.

In examining the effects of burning fossil fuels we must not overlook the human needs being met by the use of these fuels. Furthermore, we can not advocate the position that all use of such fuels is bad and that our people should consequently be asked to no longer use these fuels and to "freeze in the dark". On the contrary we must be mindful of legitimate human needs and consider all the economics of any proposals regarding energy use in our society. To be successful any proposed initiatives must not only be viable but must also be perceived by the general public to be reasonable and viable.

Beyond expressing our concerns and perhaps refusing to buy the products of the deforestation there is probably little we can do about the destruction of the rain forests in Brazil. There is however something that we can do about sulfur dioxide emissions and acid rain in the eastern part of our own country and that is to continually remind those who burn coal in the east that high quality, low sulfur western coal is available to meet their legitimate needs and that the use of western coal would not only reduce their emissions, acid rain and death of their lakes but would also keep Canadians employed, aid our economy, and reduce costs of unemployment rather than exporting jobs to the United States from whom we are importing high sulfur coal. The use of western coal can be further augmented by purification and size processing and costs to the consumer could also be reduced by using alternate forms of transportation such as utilizing pipelines.

Recovery of sulfur in gas processing is much more efficient in recent years and unquestionably close attention should be maintained to ensuring that sulfur dioxide emissions are minimized in Alberta as much as possible. The utilization of effective scrubbers and condensers should be designed where ever appropriate and to any facility processing or utilizing fossil fuels.

Some emissions are proportional to population and become a much greater problem with population concentration such as we see in our major cities, the smog situation in Calgary perhaps being the most notable. Many factors enter into this population concentration not the least of which are economic factors including taxation policies and levels and other cost considerations which lead employers who could well locate elsewhere to choose to operate their business in the major cities. These taxation policies could well be changed leading to an economically level playing field across the province and encourage decentralization of business, industry, and population and consequent decrease in concentration of emissions and smog.

We could also utilize biological systems to reduce carbon dioxide concentrations for example, by the active promotion of large scale tree planting.

With respect to trees, logging, and the Alberta Forest Service it should be noted that over the past three (3) decades Alberta has had the best track record with respect to silviculture of any jurisdiction in North America. We continue to support the position that timber is a renewable resource which should be utilized by man and should be properly managed. This not only implies planting but also implies that trees should be harvested when mature and not be allowed to fall prey to disease, to rot and to burn. The recent disastrous experience in Yellowstone National Park in the United States encouraged by those who advocate natural rather than planned reforestation serves as a shining example of what not to do.

We have heard arguments over the past few years that nuclear power is clean, cheaper and the preferred source of energy for the future. We would take issue with the claim that nuclear power is cheaper as true cost accounting should include the cost of the massive public subsidy of the construction of nuclear plants, the hidden costs of waste disposal, as well as the increasingly apparent high costs associated with maintenance, leaks, and contamination. In reality looking at total costs as well as health hazards, nuclear power is not cheaper and is not cleaner.

Public awareness and recession economics may well dictate a transition to more of a conserver society. At the same time the public should be provided with balanced information regarding issues such as use of energy and further the public must be allowed reasonable individual choice. Indeed without public support no initiative will succeed no matter how logical it may seem in the mind of an individual proponent.

Only if they are perceived to be reasonable by the general public can any actions taken by consumers and producers to reduce emissions be practical and achievable. We hope and trust that some of the suggestions we have made with respect to improving air quality will be incorporated as part of Alberta's ultimate clean air strategy.

OFFICE OF THE MANAGER
TOWN OF PINCHER CREEK
BOX 159, PINCHER CREEK, ALBERTA T0K 1W0
FAX 627-4784 PHONE 627-3156

WRITTEN PRESENTATION: CLEAN AIR STRATEGY FOR ALBERTA

We appreciate the opportunity to address this forum and encourage the government to continue holding forums like this to allow citizens to express their concerns.

The Town of Pincher Creek is concerned about the environment and environmental issues. Above all we wish to preserve the beautiful natural surroundings we have all around us. We support any legislation that will preserve and enhance our environment provided it does not have a detrimental effect on our current way of life and living standards. The concept of sustainable development is strongly supported by the Town of Pincher Creek. The main smoke-stack industry in the area, the Shell plant, has substantially reduced its emissions and continues to improve their performance in this regard. We commend and support them in their efforts.

It is our opinion that industries and individual companies should be environmentally responsible and sensitive to the concerns of both the local population and the population in general. Government policies and regulations that stress this responsibility by holding individuals as well as organizations accountable for their actions would be strongly supported by the people of Pincher Creek. Pincher Creek commends the government for the direction it is taking regarding environmental issues and we encourage it to continue to focus on environmental concerns.

The Town would encourage the further development of policies and regulations that provide more protection to the environment, address the specific concerns of citizens regarding local companies and industries, and punishes irresponsible organizations and indeed individuals. However, we would not endorse or support any policies or regulations that completely inhibit development or give organizations reasonable time to react to the changes in policies and regulations. As previously stated we strongly endorse the concept of sustainable development.

Office of the Mayor

December 14, 1990

Clean Air Strategy for Alberta
Bag 1, Mail Room
Main Floor, North Tower Petroleum Plaza
9945 - 108 Street
Edmonton, Alberta
T5K 2G6

Dear Sir or Madam:

RE: CLEAN STRATEGY FOR ALBERTA

Council of The City of Red Deer, at its meeting held on Monday, December 10, 1990, unanimously passed the following motion with regard to the above-noted topic:

> "RESOLVED that Council of The City of Red Deer having considered reports re: Clean Air Strategy for Alberta hereby endorses the issues raised by the Parks Manager and that same be forwarded to the province for consideration in drafting a Clean Air Strategy for Alberta and as presented to Council December 10, 1990."

I am enclosing herewith a copy of the report from the Parks Manager which is referred to in the above-noted resolution. We trust that you will take into consideration the issues raised by the Parks Manager when drafting a "Clean Air Strategy for Alberta".

We thank you for the opportunity to provide comment on this important issue and should you require further information or clarification please do not hesitate to contact the undersigned. Trusting you will find this satisfactory.

Sincerely,

McGhee

R. J. McGHEE
Mayor

/bd

Encl.

c.c. Director of Community Services
Parks Manager
Environmental Advisory Board
City Clerk

P.O. BOX 5008, RED DEER, ALBERTA, T4N 3T4 Telephone 342-8155

DATE: **November 20, 1990**

TO: **ENVIRONMENTAL ADVISORY BOARD**

FROM: **DON BATCHELOR**
Parks Manager

RE: **CLEAN AIR STRATEGY FOR ALBERTA**

Alberta Energy and Alberta Environment are launching a number of public open houses and public forums across the province. In addition, they will be inviting briefs from individuals, groups and other levels of government to obtain information on drafting a Clean Air Strategy for Alberta.

Attached is a letter from Mr. R. Mitchell, Coordinator, Clean Air Strategy for Alberta, to the City Commissioner requesting the City of Red Deer's participation in this process. I have also attached a series of articles and documents for the Board's review.

The primary purpose for the Province inviting public and municipal input is:

a) to identify and clarify the possible impact of energy related emissions on the environment (i.e. impact of fossil fuels on global warming, acid deposition and smog);

b) to outline practical and achievable actions that can be undertaken by consumers and producers to reduce emissions.

With the attached documents as background information, I have outlined below some concerns or issues which should be forwarded to City Council and then to the Province for their consideration in drafting the Clean Air Strategy. A public open house session will also be conducted in Red Deer December 6, 1990 at 12:00 noon, and 7:00 p.m. respectively, at the Capri Hotel (see attached).

CONCERNS - CLEAN AIR STRATEGY

1. Identifying the impact of energy related emissions from fossil fuels on the environment is best dealt with by the experts. The effects of CO_2, SO_x, NO_x, VOC_s, and CH_4 emissions vary significantly geographically across the province

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and an extensive monitoring/recording system should be set up to collect data. This data would clearly identify problem areas, potential sources of the problem and, therefore, solutions and achievable actions can be considered.

2. The production of electricity in the province is largely generated from coal powered electrical plants. The consumption of coal emits significant amounts of gaseous emissions; consideration must be given to initiatives in generating power by some other means (i.e. hydro, wind, etc.) across the province. The Electric Utility Planning Council has submitted a brief that attempts to address the consequences of coal produced electricity and has offered some alternatives.

3. The issue of public transportation can have a significant effect on air quality. Incentives must be put in place that promote, encourage and make mass transit systems desirable, accessible and affordable to the public.

4. Programs that are directed to the Efficient Energy Management of Facilities/Industries which presently exist through Alberta Government Departments, utility companies, private companies and municipalities should be applauded. These efforts are but the beginning of a long process of informing, educating, training and encouraging the public and industry to undertake energy-efficient practices at home and in the work place. The Energy Audit Buses, for example, is a program that needs to be expanded such that homeowners, apartment building managers, commercial and industrial developers, and different government officials can access this tool of measuring energy consumption in buildings and operations. From these consumption statistics one can identify means of increasing energy effectiveness. To be effective, an extensive public awareness program should be launched to inform everyone of the procedures and practices that can lead to improved energy use (see "Energy Efficiency - Clean Air Strategy of Alberta" brochure). As illustrated by the Edmonton Public School Board, the initial investment of modifying operational procedures on their buildings has resulted in a $10.2 million saving over 7 years in fuel savings and has contributed significantly to environmental sustainability.

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5. All educational institutions should contain, as part of their curriculums, the principles of reduce, re-use and recycle. Schools have the captive audience to instill environmental management practices as part of every day life.

6. Since gaseous emissions, in particular carbon dioxide, can be filtered and processed by trees, the concern for clean air can perhaps be best illustrated to the public through emphasizing the benefits of trees to our urban environment. Trees are something everyone can identify with, can plant, can enjoy the immediate benefits, and could be taught the long-term environmental benefits.

   Not only do trees provide colour, landscape enhancement, shade, aesthetics, screening, etc., they most importantly produce oxygen, while consuming carbon dioxide. In addition, this process cools the earth by evaporating water into the air. Provincial and municipal initiatives that encourage and support tree planting programs should be promoted and assistance should be considered in the form of expertise, funding, plant material, etc.

   A tree planted in an urban area can be 15 times more effective than a forest tree in reducing the build up of carbon dioxide in the atmosphere. Urban trees also filter the air of dust and other particulars providing a cleaner air. Programs such as Arbor Day and Environment Week can be expanded upon to encourage individuals to plant trees in their yards, developers to incorporate tree planting in commercial and industrial developments, and all levels of government to plant trees within urban areas. Assistance programs, such as tree planting grants from the Province, may be the needed impetuous to launch a beneficial public education program on the "Benefits of Trees" and a major thrust towards tree planting initiatives.

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RECOMMENDATION:

That the Environmental Advisory Board support and recommend to City Council that the concerns outlined in the Parks Manager's Report be forwarded to the Province to be considered in the drafting of a Clean Air Strategy for Alberta.

DON BATCHELOR

DB/ad

Att.

Commissioners' Comments

We concur with the recommendations of the Administration and Environmental Advisory Board.

"R.J. MCGHEE"
Mayor

"M.C. DAY"
City Commissioner

LEGISLATIVE ASSEMBLY
ALBERTA

GRANT MITCHELL, M.L.A.
EDMONTON MEADOWLARK

October 25, 1990

Dear Reader:

I am sending you some information on environmental issues that have been dealt with by the Liberal Caucus during the past session of the Legislature. This provides an indication of subjects that we consider important and of environmental policy improvements for which we are striving.

The list is not exhaustive. We continue to develop policy on existing issues and new issues are always arising. If there is any specific environmental matter that concerns you, or if you would like more information about the Liberal position on any topic, please let me know.

May I also draw your attention to the form at the end of the attached environmental report. It seeks information concerning your interest in receiving our policy material.

Yours truly,

Grant Mitchell, MLA
Liberal Environment Critic

GM/mg/kb
Enclosures

LEGISLATIVE OFFICE:
ROOM 204
LEGISLATURE ANNEX
EDMONTON, ALBERTA T5K 1E4
TELEPHONE: (403) 427-2292
FAX (403) 427-3697

CONSTITUENCY OFFICE:
6721 - 177 STREET
EDMONTON, ALBERTA T5T 4K3
TELEPHONE (403) 444-4757

RECYCLED BOND

LIBERAL'S LEGISLATIVE AGENDA FOR THE ENVIRONMENT

Spring session, 1990

The Liberal's Legislative agenda was embodied in two areas of legislative initiative:
1. Bills and Motions
2. Points made in Question Period and Media Releases

1. BILLS AND MOTIONS

The environmental issues on which the Liberal Caucus introduced Bills or Motions can be divided into three categories, concerning:
1.1 Improvements to the process by which environmental policy is developed;
1.2 Environmental issues of specific relevance to Alberta;
1.3 Environmental issues of global importance.

1.1 Improvements to the Process by which Environmental Policy is Developed

There are many specific environmental issues in Alberta which received the attention of the Liberal Caucus, but environmental matters cannot be dealt with simply on an ad hoc basis. We need legislated processes to protect the environment, to allow for public input into legislation, for an ongoing public review of environmental issues and for recourse by the public when their values and judgement differ from those of the government. Bills 205, 218, 238, 251 and 272 address these needs.

Bill 272 Environmental Assessment Act. This Bill would establish a board of impartial experts to review all significant industrial development projects and other initiatives, that might have serious environmental impacts. It would be able to review forest management agreements and pulp mills, including those already built. It would, among other things, provide for open public hearings and for the funding of public intervenors.

Bill 238 Environmental Ombudsman Act. The Environmental Ombudsman would give Alberta an environmental "watchdog", able to intervene on behalf of the public, where citizens feel that government action or inaction has been inappropriate. At present, the only recourse is for a citizen to seek the help of the Courts, which is both costly and cumbersome.

Bill 205 Freedom of Information and Protection of Personal Privacy Act would require the provincial and municipal governments to release information and documents of relevance to the public interest. This would enable public access to information concerning the full range of government activities, including environmental policy.

Bill 251 Forest Industry Development Act would end the conflict of interest that currently exists within the Department of Forestry, Lands and Wildlife since that department has responsibility both for protecting features of the environment and, on the other hand, for promoting forest industry development. This Bill would remove the latter responsibility to the Department of Economic Development and Trade, enabling the Department of Forestry, Lands and Wildlife to concentrate on the task of conservation.

Bill 218 Agricultural Resources Conservation Board Act. Alberta has only a limited amount of good quality agricultural land. Yet, each year, we lose between 1500 and 2000 acres of prime farmland to non-agricultural uses. The Environment Council of Alberta proposed the idea of an Agricultural Resources Conservation Board in 1984, but the government has taken no action. This Liberal Bill would establish such a Board to minimize the loss of farmland and to stimulate agricultural practices that will protect and recover agricultural land.

1.2 Environmental Issues of Specific Relevance to Alberta

Motion 261 Under a Liberal government all new pulp mills and forest management agreements would be subjected to a full environmental review, as laid down in Bill 272, described above. In an attempt to deal with the current situation, Liberal Environment Critic Grant Mitchell presented a motion calling upon the government to place a moratorium on all pulp mill developments until every one of the projects not yet licensed has undergone a proper public environmental assessment process. The motion requested the government to take into account available zero-effluent technology and to include an assessment of each forest management agreement.

Bill 202 Recycling Act was the Liberal priority Bill this session and was thus introduced by Liberal Leader Laurence Decore. The Bill is designed to promote waste reduction, establish a province-wide recycling program and stimulate recycling industries and markets for recycled materials.

Bill 210 Ecological Reserves and Heritage Rivers Act. Alberta has only 12 ecological reserves (including the recently announced Rumsey Reserve), most of which are of inadequate size. Eight distinctive types of natural area in Alberta are still unprotected. This Bill would require the government to establish ecological reserves to reflect each of the 17 types of ecological region in the province. The reserves would be created large enough to preserve the natural flora and fauna which they represent. Under this Bill, Alberta would also be required to participate in the Canadian Heritage Rivers System programme. The Liberal Caucus feels that it is essential that we preserve those unique parts of our environment that, once destroyed, can never be recreated. A copy of remarks made by Grant Mitchell at the second reading of this Bill is enclosed, for further information.

Bill 212 Alberta Youth Conservation Corps Act would establish a voluntary youth conservation corps to undertake conservation projects in Alberta. Liberal Education Critic Yolande Gagnon introduced this Bill not only to help preserve our environment but because such a Corps would have an important educational aspect, providing a greater understanding of environmental issues.

Bill 224 Water Transfer Control Act. Water is becoming an increasingly scarce resource, not only in southern Alberta, but elsewhere. This Bill, which was introduced by Liberal Agriculture Critic Nick Taylor, is designed to ensure a secure water supply for Alberta by prohibiting the transfer of water out of a provincial drainage basin without the approval of the Minister of the Environment.

1.3 Environmental Issues of Global Importance

Motion 225. Although there is still some controversy about the potential for global warming, due to increased carbon dioxide and other "greenhouse gases" in the atmosphere, the consequences of delay could be so serious that action is required now. Grant Mitchell presented a motion calling on the government to reduce Alberta's contribution to global warming by initiating economically responsible measures that will reduce, by the year 2005, the discharge of carbon dioxide to 20% below the levels in 1988. He also urged the government to investigate what measures are necessary to mitigate the anticipated effects of global warming.

Bill 261 An Act to Phase Out the Use of Chlorofluorocarbons. At present, when we discard a refrigerator or a car with air conditioning, chlorofluorocarbons (CFC's) escape into the atmosphere, damaging the ozone layer and contributing to global warming. Facilities to collect and recycle or destroy these CFC's would be established under this Bill. It would also supplement federal legislation in setting time limits for phasing out the use of CFC's and other gases which damage the ozone layer.

2. POINTS MADE IN QUESTION PERIOD AND MEDIA RELEASES

During the spring session of the Legislative Assembly, the Liberal Caucus raised a wide range of environmental issues, through question period, other debating opportunities and media releases. These included:

2.1 Pulp Mill and Forestry Developments

- Disclosure of information on dioxin levels in fish taken from the Wapiti River.
- Request that government reassess new information on dioxins and furans, which indicate that human health effects may be much greater than previously thought.
- Failure of the government to issue a certificate of variance and make a public announcement when discharges from the Proctor and Gamble Pulp Mill at Grand Prairie exceeded the license limits in 1988.
- Government tardiness in analysing samples of fly ash taken near the Millar Western Pulp Mill in Whitecourt and the potential health effects of contaminants in the flyash.
- Failure of the government to accept and act upon the findings of the Alberta-Pacific Pulp Mill Review Board; the waste of public funds in engaging the Finnish firm Jaakko Poyry Consulting Inc., to carry out a survey of the scientific data submitted to the Review Board; the lack of credibility of this firm, which describes itself as "serving forest-based industries", to carry out an independent review.
- Request for baseline water and wildlife studies as required by the Alberta Pacific Review Board and for an independent review of the new Alberta-Pacific proposal.
- Request that the government require the Alberta-Pacific Pulp Mill to be chlorine-free, eliminating even chlorine dioxide in the pulping process.
- Failure of the government to allow public input into the license to operate for the Daishowa pulp mill at Peace River, even though such input was allowed for new licenses for the Proctor and Gamble mill and a similar process was expected by Daishowa.
- Criticism of government forest management policy, as seen in the Naylor Hills area, where deforestation has disrupted the local drainage pattern and prevented regrowth of the forest cover.
- Request for an Environmental Impact Assessment of the wood processing plant to

be operated by Sunpine Forest Products Ltd. of Rocky Mountain House, and of the forest management area to be logged by the company.

- The government "give-away" of Alberta's timber resource, due to the fact that the stumpage fees for timber quotas have not been raised since 1975. This is costing the province up to $20 million a year in lost revenue.

- Concern at the low minimum bid price for timber quotas and the need for the government to take steps to ensure that there is not collusion between companies to reduce competition and thereby lower prices for timber quotas.

- Criticism of the government's new plans for public involvement in forest management planning, as the public will only be involved after the forest management agreement has been signed, and the company itself is responsible for liaison with the public. Need for assurances that native groups will be involved in each step of the public input process.

- Demand that logging be ended in Wood Buffalo National Park.

2.2 Natural Resources Conservation Board Bill - Government Bill

- Shortcomings of the proposed government Bill 52, Natural Resources Conservation Board Bill, a piece of legislation which does not even fall under the jurisdiction of the Minister of the Environment. The Liberal Caucus has serious reservations about this Bill, due to the potential for government manipulation of the Board. The Board does not have adequate powers and in many cases the decision to conduct a review is left to the discretion of the the government. There is reason for further concern that no reviews of Forest Management Agreements will be conducted.

2.3 Global Warming

- The Minister of Energy's failure to endorse the international resolution calling for a 20% reduction in carbon dioxide emissions by the year 2005 and the need to provide leadership in addressing the issue of global warming.

- Request that the Alberta government establish a forum on global warming, similar to that organized by the federal government for decision-makers in Ottawa.

- The potential effect of global warming on agriculture in Alberta, as indicated by an Environment Canada publication "The Effects of Climate and Climate Change on the Economy of Alberta" and a report by the Alberta Research Council on "Adapting to Climatic Change in Alberta".

2.4 Conservation

- Failure of the government to commit itself to a conservation strategy for Alberta.

- Request that the government endorse the World Wildlife Fund and Canadian Parks and Wilderness Society Endangered Spaces Campaign.

- Request for an Environmental Impact Assessment of the proposed developments in the Bow Corridor.

- The Premier's repeated undermining of the power of the Minister of the Environment and the general lack of confidence in the Minister of Environment's ability to deliver on his promises concerning environmental protection, conservation and waste reduction and recycling.

2.5 Waste Management and Recycling

- Request for government to introduce a recycling policy, including a government procurement policy, e.g. for recycled paper.

- The excessive cost of the Alberta Special Waste Management Plant at Swan Hills, which took the entire increase in the Environment Budget in 1990, especially when compared with the lack of funding for recycling.

- Government failure to continue financial support of the Ryley composting project, without any advance warning, even though this project of international fame has a 95% participation rate and reduces the solid waste stream in Ryley by 35 - 40%.

- The need for a comprehensive government plan for handling biomedical waste, some of which is at present sent to landfill sites.

2.6 Water Issues

- Concern about compensation for the water rights lost by the Peigan Indians, due to the construction of the Oldman River Dam.

- Lack of an opportunity for farmers and farm organizations to put forward their opinions before the government introduced new regulations allowing oil companies to take up to one half the potable or usable water from any water reservoir to enhance oil and gas recovery. Government failure to ensure that aquifers are not polluted by chemicals.

- Government policy that allows over 300 towns in Alberta to flush their sewage lagoons and storm water once or twice a year into creeks and streams, with particular reference to the Wabash Creek and the Olds Creek.

- The involvement of the Minister of the Environment in discussions about the construction of a road through Lily Lake.

2.7 Other Issues on which the Liberals have taken Public Positions

- Inadequate representation of environmental interests in the Round Table on the Environment and Economy.

- Request for public hearings into game ranching before proceeding with government Bill 31, Livestock Industry Diversification Act. As the government failed to agree to such hearings on this controversial issue, the Liberal Caucus decided to vote against the Bill at third reading.

The above list indicates the breath of environmental concerns expressed by the Liberal Caucus. Should you require a copy of any specific piece of legislation, do not hesitate to contact Grant Mitchell at the Legislature, telephone 427-2292.

A FINAL NOTE

The Liberal Caucus continues to work for a clean environment and to ensure that all new developments are environmentally acceptable and we hope you will be interested in receiving future editions of the Liberal's Legislative Agenda for the Environment. However, we do not want to waste paper by mailing to those people who do not want to receive it.

If you wish your name to be removed from our mailing list, please let us know, either by telephone (427-2292) or by completing the appropriate line on the slip below.

Please complete the slip below if you wish to receive more information about the Alberta Liberal Caucus. We will be happy to put your name on our mailing list for either the environmental media releases or for our weekly mailout of all Liberal Opposition media releases.

……………………………………………………………………………………………………

Name:……………………………………………………………………………………………
Address:…………………………………………………………………………………………
Town: ……………………………………Postal Code: …………

Telephone (home) ……………… (work)………………

Please tick as appropriate:

.... I would like my name removed from the Liberal Opposition Environmental Mailing List.

.... I wish to receive media releases on environmental subjects.

.... I wish to receive the weekly package of Liberal Opposition media releases.

Please return slip to:
Grant Mitchell, MLA, Liberal Opposition, #204, Legislature Annex, Edmonton, T5K 1E4.

Province of Alberta

The 22nd Legislature
Second Session

Remarks on Bill 210
Ecological Reserves and Heritage Rivers Act

Grant Mitchell, MLA
Edmonton-Meadowlark

Excerpted from *Alberta Hansard*
May 31, 1990

MR. MITCHELL: Mr. Speaker, it's with a great deal of anticipation and pleasure that I present this Bill. It is with anticipation and pleasure because I believe that this Bill is extremely important to an enlightened environmental policy on behalf of the government of Alberta. Certainly there are, in one sense, what appear to be issues of a higher public profile than ecological reserves and heritage rivers. There are issues of a more pressing and focused nature perhaps. But there is no issue more important than the issue which Bill 210, the Ecological Reserves and Heritage Rivers Act, addresses in the broad spectrum of environmental issues.

Mr. Speaker, this Bill will serve to amend the current Wilderness Areas, Ecological Reserves and Natural Areas Act in three ways: first, to require that at least 12 percent of the province be designated by the year 2000 to be protected in its natural state; second, to designate at least one ecological reserve of adequate size in each of the 17 natural regions of the province by no later than the year 2000; and third, to require that Alberta join the Canadian Heritage Rivers System program and designate heritage river areas along rivers of special ecological and/or historic and/or cultural importance.

I was impressed vividly several weeks ago, Mr. Speaker, when speaking to a friend of mine about the significance of ecological reserves and heritage rivers. This friend said, "You know, Grant, we're not talking about ecological reserves; in fact, what we are talking about are ecological museums." If one considers the concept of museum, you begin to get a sense of how important this Bill and the program that it represents are. Museums are a place where we put things that we want to preserve because they have disappeared: artifacts of previous ways of living, artifacts of previous ways of life. Well, Mr. Speaker, it is becoming painfully apparent, not only in the world at large and in general but also in this province, that there are kinds of biological ecosystem spaces in this province which are disappearing, which in fact have disappeared, and there are more that will disappear or will be endangered if we do not move in a responsible and reasonable fashion to set them aside and to protect them in their pristine, unencumbered, untouched, natural condition.

I'll give you an example of several such areas. The Rumsey area. Less than 5 percent of the original aspen parkland in the world remains. The small block of original aspen parkland found in the Rumsey area, about a 180 square kilometre area, is the largest remnant of this kind of ecosystem, this kind of ecological area, in the world.

Milk River, Lost River. This is, Mr. Speaker, a biologically diverse area which includes several plants and animals found nowhere else in Canada. A tiny ecological reserve has been set aside, 11 square kilometres, but this particular area, the Lost River area, has not been set aside in any kind of reserve area.

Mr. Speaker, what we are talking about is a program, if we are not careful in other ways in how we encroach upon wildland areas, that ultimately and to some extent today in fact is an ecological museum program. When I think about the risk of this government not proceeding quickly enough – in fact, reacting very cynically through the statements of their minister – to the ecological reserve program, to the endangered spaces program, I can draw a very vivid analogy. For the Minister of Recreation and Parks to say that ecological reserves are a huge land grab, for this minister to watch while certain ecological areas of this province literally become extinct to this province, extinct in some cases to the world, would be tantamount to this government finding those dinosaur bones in the Tyrrell area and throwing them away.

Isn't it ironic, Mr. Speaker, that something that is millions of years dead we place an intrinsic value on? Fortunately, we do, and this government is to be congratulated for having done that. We would not contemplate for a minute throwing those natural resources, those profound historic resources away. At the same time, this minister will sit paralysed while very, very sensitive, very rare ecological areas are being frittered away because we continue, in our development initiatives, to encroach upon them and to kill them. Mr. Speaker, we are talking about ecological museums. We are talking about a travesty and a tragedy if this government continues the practice of the delays that we have seen.

It's very interesting to note that the Minister of Recreation and Parks wrote an open letter to the Alberta chapter of the Canadian Parks and Wilderness Society, tabled in May of 1990 in the Legislature. He responds to their article, and it says in here:

> Your article states that it is incorrect to assume that "there's no rush to ensure protection for Alberta's wildlands."

The minister goes on to say:

> Well, there is a need for ongoing work on this kind of protection, but rushing in without good data, good plans and good choices of sites, can be equally dangerous, particularly for the sites involved and for our long-range objectives.

This, Mr. Speaker, from a minister of a government which in 18 months set aside 200,000 square kilometres of northern Alberta in forestry management agreements. If that isn't rushing, I don't know what rushing is. They have had no qualms about rushing in to set aside huge tracts of northern Alberta at the disposal of companies to move in and make land use choices without adequate study, saying, "We'll do ongoing study." And then this minister has the gall to turn around and say, "Well, we can't rush in and set aside 17 ecological reserves right away," when they are in the order of maybe 28 square kilometres – in fact, some of them are less than 28 square kilometres – where they in no way approach the massive size of the forestry management areas that have been set aside in 18 months. Why is it not the case that we could go in and set aside all the ecological reserves right now, set aside more than what might ultimately become the prescribed and proper size, and do ongoing studies to ensure that ultimately we do make the right decision? Why is it that he doesn't set them aside now and then worry about making sure that his concerns are met, if that's absolutely necessary, later? Certainly the precedent has been set.

Mr. Speaker, we need ecological museums, and we need action. We do not need a minister who stands up and calls ecological reserves a massive land grab. We do not need a government who is perfectly prepared to set aside 200,000 square kilometres for development and can't see their way clear to setting aside 200 or 300 or 400 square kilometres for future generations not only to appreciate but literally for the survival and success of our species and of all species on the face of this earth.

Mr. Speaker, this Bill is in support of, among other things, the endangered spaces program today being promoted on an international level by the World Wildlife Fund and by the Canadian Parks and Wilderness Society. I know that Albertans, and this government in particular, look out and say that Alberta has miles and miles of untracked lands. Well, Mr. Speaker, those lands have been encroached upon in many different ways. Even ecological reserves that have been set aside to this point have been encroached upon, have not been managed properly by this government, and very, very quickly there will be very few wildlands left even in a province like Alberta.

Mr. Speaker, the advantages of an aggressive ecological areas and heritage rivers program are many, and I would like to list several. First of all, it is critical to gene pool conservation. If we are to avoid the extinction of rare species of animals and plants, then we must set aside areas, ecosystems, which sustain the lives of those animals and plants. There is a very critical relationship between endangered spaces and endangered species. For the longest time we talked about the extinction of species and tried to focus on the animal itself with our concern. It has now come to scientific conclusion that of course animal species are endangered because their spaces are endangered. We require ecological areas, wilderness areas, and heritage rivers to be set aside to preserve a gene pool; to allow over-harvested species to return to normal levels; to avoid the extinction of certain rare species; to maintain the diversity of species necessary for the health of animals, for the health of our crops, and for the health of humans. This program is essential for the preservation of habitat, to preserve ecological diversity, and to protect ecosystems. It also underlines the recognition of the need for plant and animal species to survive, regardless of what value or lack of value we may place on any given animal or species.

Mr. Speaker, it is also the case that contrary to the conventional wisdom held by this government, these are not noneconomic programs. These, in fact, are programs which have an essential economic value and which may contribute very significantly in the short run and in the long run to the strength of Alberta's economy. There is a scientific research value. Mr. Speaker, it is a service that we can provide the world if we can set aside areas that attract scientists intent upon research into species of plants and animals.

It is also true that ecological reserves and heritage rivers are critical and very important to the future of tourism in Alberta. I think we cannot emphasize enough the significance of our wildlands and our wildland tourist opportunities not only today but especially as they will grow in the future in a world that is increasingly seeing wildland spaces disappear. Imagine people living in the crowded European context wanting to come to a place like Alberta where there are still untapped, pristine, unfettered natural areas.

It is also very important, Mr. Speaker, that ecological areas and heritage rives be set aside for their contribution to resource protection and their contribution to resource management.

And a final point, a final value to this kind of program, Mr. Speaker, is one that I believe is underestimated and hasn't been addressed very broadly, and that is the cultural heritage significance of ecological reserves, of certain ecosystems, to Albertans' way of life. We have a certain character, have a certain strength, have a certain value in our lives because of the physical surroundings within which we live. We view the world differently than somebody who lives elsewhere in the world without mountains. We view the world differently than somebody who lives elsewhere in the world without certain kinds of prairie grasslands. We view the world differently than people who live in different physical surroundings. I believe that our roots, our traditions, our sense of purpose and place in our physical surroundings and in our society and, therefore, our culture are inextricably tied to the preservation of the natural surroundings within which we find ourselves.

Mr. Speaker, we are not asking for very much in this program. We are not asking to set aside huge portions of this province. We are not asking to set aside portions of this province that in any way, shape, or form even approach the size of areas that have been set aside, for example, for forestry management areas. What we are asking in this Bill is for a very reasonable amount of this province to be set aside, not to be put out of commission – not put out of reach of Albertans, not put out of commission for economic reasons, which are so important for this government – but, in fact, to be set aside for all kinds of valuable reasons for Albertans now and in the future.

The circumstances in Alberta currently with respect to ecological reserves and the setting aside of natural areas, Mr. Speaker, are these. Approximately 9.4 percent of our province is protected in some way, although I use that term "protected" very loosely, because the consistency of management of "protected areas" is very questionable in this province. Of that, only 8.5 percent is reserved with no logging, mining, or sport hunting, and almost 90 percent of what is set aside is set aside not in provincial reserves but in fact in national parks. The provincial commitment to reserve lands of one form or another, Mr. Speaker, is 1.2 percent of the area of this province, and of that, only .03 percent is set aside in any kind of ecological reserve at all. In fact today, Mr. Speaker, of the 17 distinct ecological regions in this province, only 11 have had designated ecological reserves set aside by this government, and any kind of analysis tells us that only three of those are large enough to sustain the species, both plant and animal species, within the areas that have been set aside.

Mr. Speaker, that is a dismal track record for this government, which commenced this program in the early 1980s. It is such a simple thing to do: to set aside 17 ecological reserves, to set aside 17 that are of sufficient size to provide for the sustainability of those kinds of ecosystems, the ecosystems that are reflected in each one of those reserves. This will not encroach upon economic development. It will not diminish the value of that land to Albertans. It will enhance and protect the value of that land and those areas and those rivers to Albertans. It is so obvious, it is so logical that this should be done, Mr. Speaker, that it is simply difficult to understand, no matter how hard one tries to analyze it, why this government seems unable and unwilling to do it.

We have no heritage rivers designated despite the fact that the Minister of the Environment, the predecessor to this current Minister of the Environment, signed a document, signed a national accord saying that we are going to be a member of the Canadian Heritage Rivers System program. We have not designated one such river. And this isn't even a complete set-aside program. This is a program that designates rivers of recreational consequence, so we can set aside some areas for recreation.

You know, Mr. Speaker, I can remember an interesting – certainly to me it was very interesting – occurrence. I was driving to the Legislature along River Road some time ago, and for some reason I remembered a day that I spent with my father 31 years ago swimming in the Ottawa River. That was a wonderful day; it was a wonderful time. I will remember it always. It was warm, the water was clear and clean, and the bottom of that river was so sandy. It was a wonderful experience for me to have, and it struck me: I would no sooner take my sons into that river today than become a Conservative. The fact is, Mr. Speaker, that you couldn't go into that river at Ottawa any longer. That was a beautiful river that has been ruined by industrial development, by unfettered and inappropriate industrial development techniques. I thought: isn't that sad? And then it dawned on me, as I drove by the North Saskatchewan River, that I wouldn't take my kids to swim in this river either. It was so far out of the realm of my consciousness that I hadn't even ever thought of the possibility of taking my kids to swim in that river.

Well, Mr. Speaker, before we know it, there won't be a river in this province that we can take our children to swim in, not one river. If we would set our minds to it in this government, in this Legislature, if we would set an objective that said, "That is a travesty; we have the resources and we have the capability to set aside rivers and keep them clean, and this Bill embraces that ability and those resources," it would be an easy thing, easily done. It would be a gift that we could give to our children, a gift that I think would lend unparalleled value and richness to their lives.

The great irony in all of this, Mr. Speaker, is that there is profound public support for the setting aside of natural areas. If ever you needed to have a vivid example of that support, you just had to go to the Canadian Parks and Wilderness Society rally at the Jubilee Auditorium a number of weeks ago in Edmonton. There were upwards of 2,000 people in the Jubilee Auditorium who came to a rally that kicked off or at least elevated people's awareness of the endangered spaces program, the program which is supported by this Bill. People have a profound desire to preserve our natural heritage in this province, a profound visceral desire to do that, and it is evidenced in polls.

A poll taken in 1987 for Environment Canada prepared by the federal/provincial task force for the 1987 national survey on the importance of wildlife to Canadians says this: 87 percent of Albertans are in favour of maintaining abundant wildlife, saying that that is important or very important; 89 percent of Albertans said that preserving endangered species is important or very important; 86 percent expressed great or some interest in participating in one or more nonconsumptive wildlife related activities – observing, photographing, feeding wildlife; 28 percent expressed some or great interest in participating in a consumptive but renewable wildlife related activity, such as hunting and fishing; 31 percent indicated that they fish for recreation, on average, 13 and one-half days per year.

A recent study by the Angus Reid polling organization found that, of Albertans in the study, 66 percent wanted protected wilderness at least doubled. Sixty-one percent was the national average; 66 percent was the case in Alberta. One in five Albertans wanted to increase protected area by four times, and 95 percent of Albertans would pay $2 at a park entrance if the money were used for more wilderness parks and the conservation of land. Albertans are aware, and this government should be aware, of the economic significance of preserving these kinds of lands. I'll just state one important statistic out of this study: 1.7 million people, accounting for some duplication or people using wildlife resources more than once in a year, participated in wildlife related activities on an annual basis, collectively spending 102 million days of their time in wildlife areas in Alberta and spending $661 million on wildlife related activities.

Mr. Speaker, it is not the case that Albertans do not want to have a program of this nature. They desperately want to have a program of this nature, and they're not just saying it; they are showing it. To use the Conservative axiom "use it or lose it" and turn it on them, well, Albertans are using it, and this government's inactivity is going to ensure that they're going to lose it. So in this case it's use it and lose it. Well, Mr. Speaker, sometimes it is difficult to comprehend that when there could be so much public support for doing this program properly, this government simply can't tap into this kind of support. I should point out that the previous Minister of Recreation and Parks had a much greater and demonstrated commitment to this kind of program. In fact, he produced a state of the art report, and I only lament that he was unable to prevail upon his seatmate the current Minister of Recreation and Parks and his government to pursue that foundation and that framework document that he produced.

Mr. Speaker, I should point out that there are two particular technical features of this Bill that I would like to emphasize, because I think they underline how effective this Bill can be. First of all, we would like to see the guidelines and the decisions about ecological reserves – their size, the technical merits of buffer zones, and so on – established by a committee: not the committee that is currently defined under the Act but a committee that would be chaired by a member of the Environment Council of Alberta, thereby having objectivity, thereby utilizing the strength, the resourcefulness, the insight of that very, very worthwhile organization. In the Bill we outlined what kind of representation. There should be government representation, yes, from the relevant departments, and also there should be public representation, but it should be quasi-autonomous to the extent that the chairperson and the overseeing, the supervision of the setting up of this program, would be done by the Environment Council of Alberta.

Secondly, Mr. Speaker, we acknowledge that this kind of program, the Heritage Rivers System and the ecological reserves program, does directly confront land use controversies, does raise questions of competing interests over the use of certain pieces of land. So we have proposed a local round table system where ranchers and farmers, oil people, seismic companies, individual members of the public, hunters and so on can sit down and air their differences and come to conclusions. In fact, there is precedent even within this government's policy, where in one case such a round table was utilized to resolve a local land use planning issue with great success. People are reasonable in Alberta about the use of our land, and people are reasonable about the need to preserve for future generations the cultural and ecological heritage that is found in the 17 distinct ecological regions of this province and in the various rivers of this province.

You know, Mr. Speaker, yes, many environmental issues are extremely difficult because they confront competing interests so, so aggressively and with so much difficulty. But in this case there is a commonality of interest over setting aside adequate-sized reserves and setting aside rivers and parts of rivers within the Heritage Rivers System. It is not a contentious political issue; it is an issue that this government could embrace and could provide leadership in not only for Albertans, not only for Canadians but, literally, for the world. Mr. Speaker, I ask this government to undertake now to embrace the opportunity to provide that kind of leadership by supporting this Bill.

PRESENTATION ON
CLEAN AIR STRATEGY FOR ALBERTA
NOVEMBER 6, 1990
7:00 P.M.
BONNYVILLE AGRI-PLEX
FROM THE TOWN OF BONNYVILLE, ALBERTA

Mr. Chairman, members of the Advisory Group.
It is my pleasure As the Mayor to welcome you to the Town of Bonnyville.

Bonnyville has the distinction of being in the heart of Alberta's lake country, with 70% of all the lakes in N.E. Alberta, and also at the centre of the area's oil and gas industry.

For us the topic of "clean air" is a vital one. We are deeply concerned that we keep the balance between the natural resource industry, and the agriculture and tourism industries. All three are vital to the well being of this Region.

The lakes and rivers were the backbone of this Region's fur trading industry two hundred years ago, and today form the foundation of our tourism attractions. Besides fishing and boating pursuits, our lakes are drinking water sources for communities and farmers alike. We do not want to see them polluted by oil and gas plant emissions. To date we thankfully have no evidence of harm by gaseous emissions.

Conversely we are aware of the large deposits of heavy oil and gas in N.E. Alberta. Our local economy stands to gain considerably from their development. It is our desire therefore to see the development of the industry, but within "safe" emission guidelines. We do not advocate an extreme standard that would adversely inhibit production such as 99.99% clean emissions. However we do expect the plants to meet or exceed on a consistent basis their licensing commitment.

Currently we are quite satisfied with the performance of the oil companies and light industry in our area, and therefore have never had cause to pursue solutions.

Our submission is strictly one of supporting in principle the efforts to keep our air clean, and requesting a balanced view in the License to Operate standards that Alberta Environment sets. There has been too big a swing of the pendulum as Alberta has reacted to some very vocal specialist groups or small groups of citizens.

Simply put, Bonnyville needs the industry money to live with, and the clean air to enjoy that living, and we expect the regulations should reflect that.

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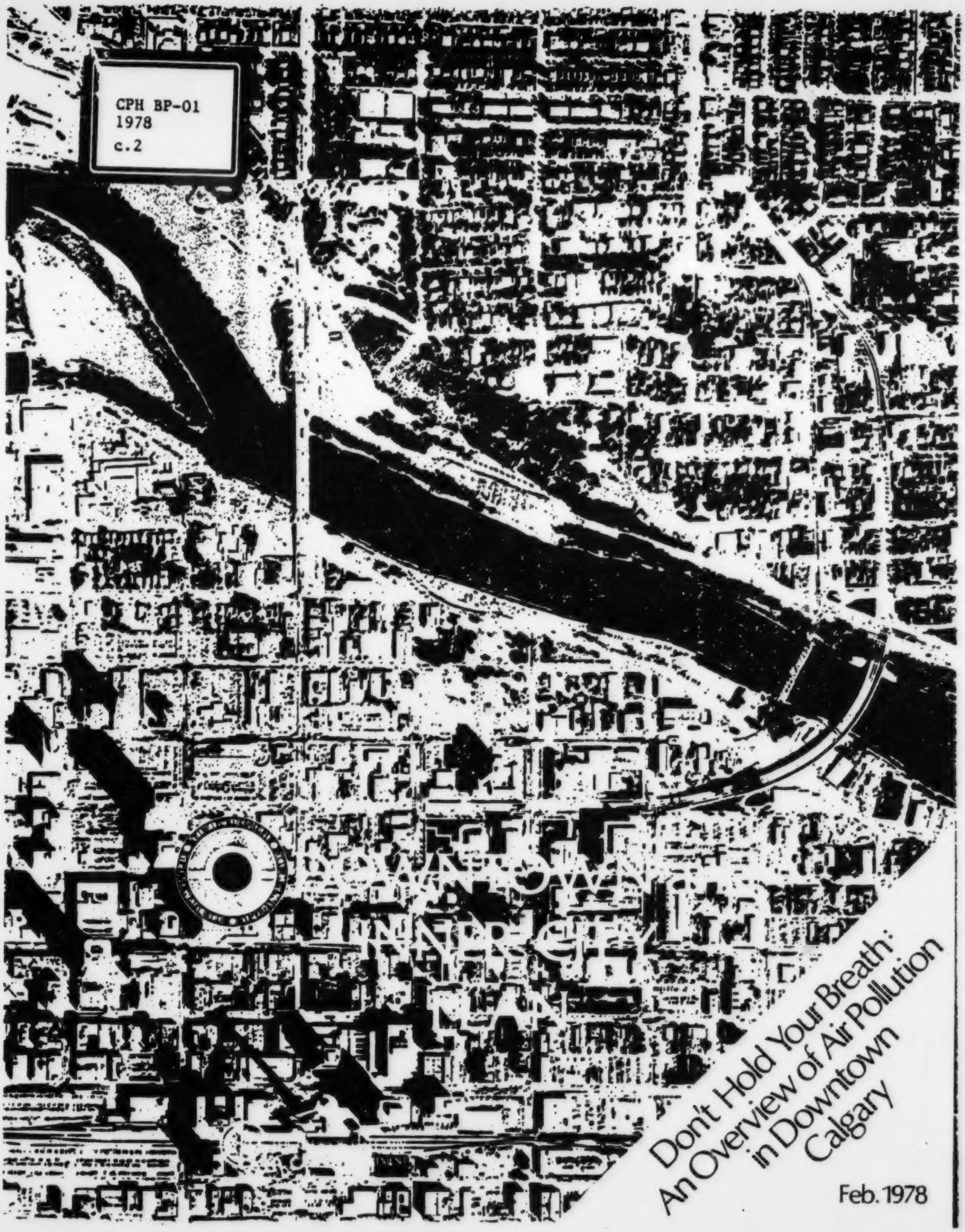
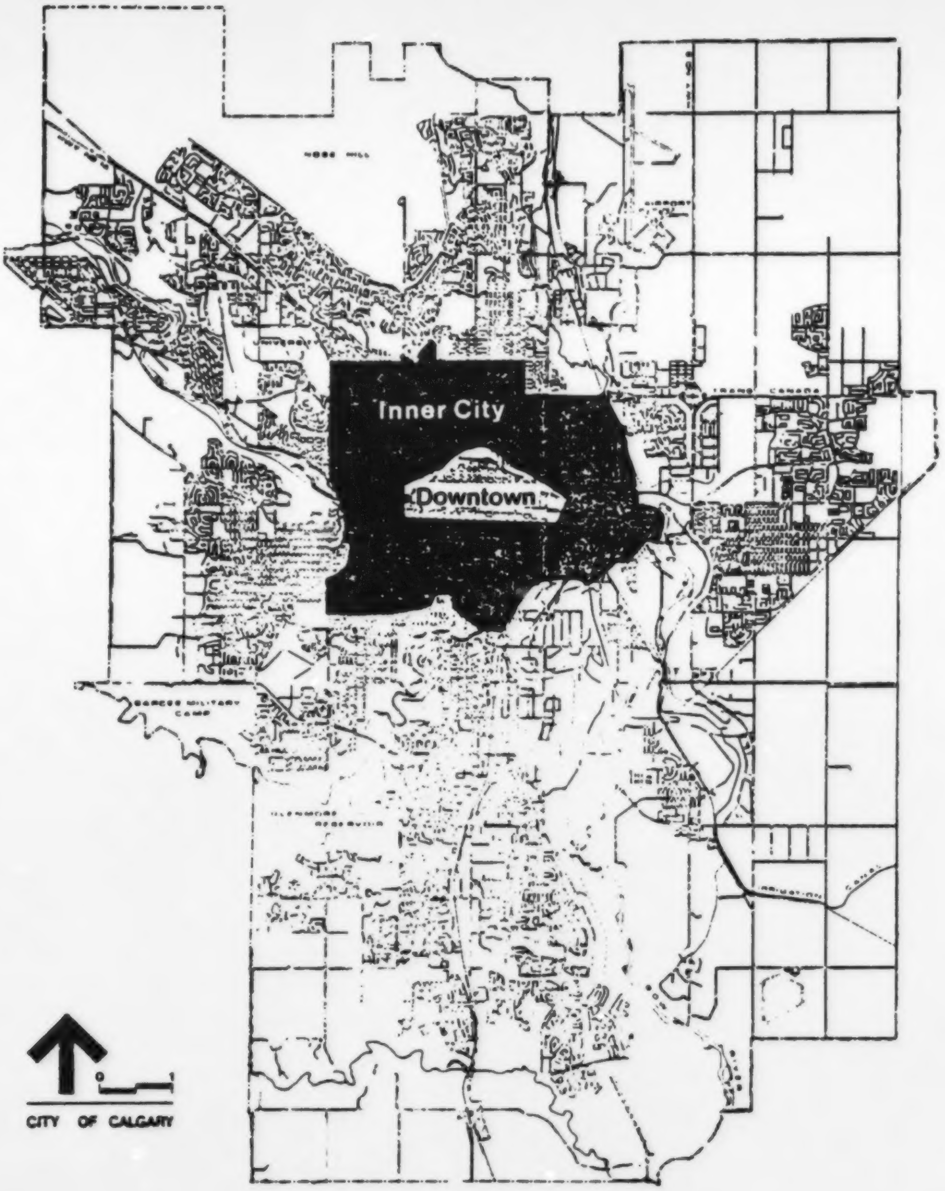

DOWNTOWN
INNER CITY

Don't Hold Your Breath: An Overview of Air Pollution in Downtown Calgary

Feb. 1978


Inner City
Downtown
CITY OF CALGARY

Don't Hold Your Breath:
An Overview of Air Pollution
in Downtown
Calgary

Feb. 1978

PURPOSE

This paper discusses the major sources, levels and implications of air pollution in downtown Calgary. For the most part, the text is taken directly from the sources referred to at the outset of each section. The report does not represent a rigorous research effort on the part of the Planning Department, rather, it is intended to present, first-hand, the observations and conclusions noted in the very few studies undertaken to date which may give substance to our understanding of air pollution levels in the downtown.

The paper begins with a brief description of meteorological considerations, including photochemical smog and temperature inversions, which affect the concentration and level of pollutants downtown. Air pollutant sources are then identified, as are the monitoring facilities and capabilities of Alberta Environment, the principle air quality monitoring agency in the city.

The paper then presents, in some detail, the results of two recent studies undertaken by research staff of the University of Calgary. The first study deals specifically with carbon monoxide (CO) levels downtown; the second, with the occurrence of carcinogenic (cancer inducing) hydrocarbons. Both studies focus on air quality within the pedestrian environment and on the impact of the automobile. Both studies, as well, conclude with thought provoking observations relative to the health effects of existing air pollution levels.

Air quality in downtown Calgary is then compared with that of several other North American cities and, from a somewhat different perspective, with the health effects of smoking.

Finally, several recommendations for planning guidelines are outlined and a number of critical questions are, again, put forward for consideration. Do existing pollutant levels create a "problem"? Should something be done to lessen pollutant concentrations and, more importantly, what and how much should be done and by whom?

SUMMARY

1. Downtown air pollutant concentrations do exceed provincial standards by a very substantial margin, and do so frequently.

2. Data are available indicating that the concentrations of pollutants at street-level are significantly (three or four times) greater than those measured by the Provincial Monitoring Apparatus - this is true too of higher pollutant levels inside downtown buildings than levels measured by the apparatus - the pedestrian environment is exposed to far greater levels of pollutants than is suggested by Alberta Environment data.

3. Motor vehicles accounted for 97.3% of all carbon monoxide levels in Calgary in 1973.

4. The concentration level of auto-induced pollutants depends in part on the number and speed of vehicles operating within the area and the extent to which physical and meteorlogical conditions act to hasten or retard the dispersion of pollutants.

5. The existence of massive, high buildings in the downtown tends to disrupt the natural flow of air from the northwest, thus hampering the dispersal of air pollutants in the area. Further, the deflection of normal air flow results in a variety of microclimatic conditions including wind tunnels and poorly ventilated "pockets" of high pollutant concentrations.

6. Normal pollutant levels are, in turn, worsened by the frequent occurrence of photochemical smog and low level temperature inversions.

7. Existing nitrogen dioxide levels constitute a potential health hazard.

8. In Smith's study, street levels of carbon monoxide downtown exceeded the Alberta standard for 23 of the 24 days tested.

9. For five of the fifteen days tested for December and January, levels of carbon monoxide in the downtown area reached concentrations that could pose a potential health problem to patients with heart disease.

10. Travellers going to and from the downtown by private auto are exposed to greater concentrations of carbon monoxide than are those travelling by public transit.

11. The amount of carbon monoxide at street-level is about three times greater in the city core than in the suburbs.

12. Epidemiological research has shown a clear statistical relationship between the incidence of non-occupational lung cancer and geographical areas of high air pollution such as the industrial and downtown areas of cities.

13. The greatest amounts of polycyclic aromatic hydrocarbons (approximately 15% of which are cancer inducing) in the ambient air of Calgary occur in the city core at street level. Concentrations of PAH in this area are three to seven times greater than in the major suburban residential areas of the city. The major source of these PAH emissions is the internal combustion engine.

14. Peak and Black suggest that the downtown pedestrian may be subjected to six times as much PAH and seven times as many carcinogens as the suburban resident.

15. In terms of carbon monoxide and carcinogen inhalation, cigarette smoking constitutes a far more serious hazard than air pollution.

16. While data are available indicating that air pollution downtown does present a health problem, and that pollutant levels will increase with the increased use of automobiles in the area, the data cannot be expected to answer the following fundamental and crucial questions:

a. How much air pollution in the downtown environment are Calgarians willing to live with?

b. What priorities should be assigned to those activities "creating" pollution (e.g. auto use) and to those "suffering" because of it (e.g. downtown residential and pedestrian environments)?

c. Who is responsible for unacceptable levels of pollution; who should pay to reduce levels to within acceptable standards and how much is air pollution abatement worth in dollars and cents?

d. What will be the effect of increased pollution on the health of the people using, and living in the downtown?

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I. METEOROLOGICAL CONSIDERATIONS*

Urban air pollution potential depends primarily upon atmospheric stability and wind speed. The normally stable air near the ground can be modified by the imput of either solar or artificial heat. Pollutants tend to be uniformly distributed in this modified region which is called the "mixing layer". The depth of the mixing layer and the mean wind speed together determine the "ventilation", which may be viewed as the effectiveness of pollutant dispersion. Poor ventilation, known also as "stagnation", favours the build-up of pollutant concentrations. Good ventilation tends to keep the concentration low (Alberta Environment 1975, pg. 30).

In Calgary, ventilation is normally good in the spring and summer, poorer in autumn and at worst in winter. Because of the normally poor ventilation in winter and autumn, small variations in mean wind speed and atmospheric stability will have much greater influence on pollutant concentrations than they would have at any other time of the year (Alberta Environment, 1975, pg. 30).

As one might expect, the existence of large, high buildings in the downtown tends to disrupt the natural northwest to southeasterly flow of air, hampering further the dispersal of air pollutants. In addition, the deflection of normal air flow results in a variety of microclimatic conditions including wind tunnels and poorly ventilated "pockets" of high pollutant concentrations.

Apart from normal meteorological and physiographic conditions air quality downtown is very directly affected by (1) the creation of photochemical smog, and (2) the frequent occurrence of low level temperature inversions. In his article discussing the downtown's air quality, Tollefson noted the impact of photochemical smog and temperature inversions to be the following: (Tollefson, 1971)

A. Photochemical Smog

Essentially, there appears to be four major "ingredients" required to create photochemical smog. These include reactive hydrocarbons, oxides of nitrogen, a relatively calm and stable atmosphere and bright sunshine .

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*This section draws heavily upon Tollefson, 1971.

The reactive hydrocarbons include trace quantities (parts per billion) of unsaturated hydrocarbons known as olefines, which must be mixed together with oxides of nitrogen. Both of these ingredients are produced, mixed and emitted by the operation of the internal combustion engine. A relatively calm, stable atmosphere is required to trap the pollutants so that the concentrations will rise to a level at which a photochemical chain reaction will "kick off". In the presence of bright sunlight, this reaction will take place in an hour or two yielding products which, if in sufficiently high concentrations, can cause eye irritation, damage to plants, rubber cracking and loss of visibility.

The above four prerequisites are all characteristics of Calgary's downtown area. For example, in an examination of local meteorological records for 1969 it was found that on more than half of the days of that year the temperature was sufficiently high to permit photochemical smog to form if the other ingredients were present.

Production of photochemical smog is accompanied by the formation of certain oxidants. Tollefson suggests that if the concentrations of hydrocarbons and oxides of nitrogen continue to increase as the population and number of cars in Calgary grow, the oxident levels can be expected to increase and complaints from citizens about eye irritation are likley to follow.

B. Temperature Inversions

In the Los Angeles basin there is little evidence of photochemical smog concentrations at temperatures less than 50^0F. Under these conditions, however, rain generally washes the reactants out of the atmosphere so that the reaction does not take place. In Calgary, on the other hand, photochemical smog has been observed at temperatures well below 50^0F but under dry conditions in which the reactants are exposed to bright sunlight. Such conditions often occur in the late fall and early spring. During these periods Calgary suffers from many low level temperature inversions which cause the products of combustion emitted by the automobile to be trapped near ground level. In 1969, Calgary's atmosphere showed an inversion from ground level to the 300 ft. level 46% of the time. During many winter days there are inversion conditions around the clock.

Under such conditions there should be concern about the build-up of hazardous concentrations of carbon monoxide in the downtown area when there is heavy traffic, and little or no wind. Relatively little is known about the concentrations of carbon monoxide which exist at street level under these conditions.

During inversions automobile exhaust (with CO emission enhanced by cold winter temperatures and the altitude) will concentrate in the downtown area. Prevailing westerly and north-westerly winds can direct this pollution along the banks of the Bow River, whose 200 foot deep valley will tend to delay its dispersal (Smith, 1975, pg. 2). Furthermore, during December, when downtown shopping is at a peak, average monthly wind speed is at a minimum, further limiting pollution dispersal (Annual Meteorological Report, 1974).

II. Air Pollution Sources

In downtown Calgary there is very little air polluting industry, per se. For the most part the major air pollutants in the area result from automobile emissions. The concentration level of such pollutants depends in part on the number and speed of vehicles operating within the area and the extent to which physical and meteorological conditions act to hasten or retard the dispersion of pollutants. While certain of these pollutants have been found to be hazardous to human health, the effects of many pollutants have not yet been fully explored, nor have their potential long term and cummulative effects.

A. Monitoring Stations

With the exception of occassional air quality studies such as those which will be discussed in the following two sections, the collection and analysis of air pollution data in the downtown area is generally the responsiblity of the Provincial Department of the Environment, Alberta Environment. Even when more comprehensive studies are undertaken they often rely on the data collected by the department or make use of the department's equipment and sampling locations.

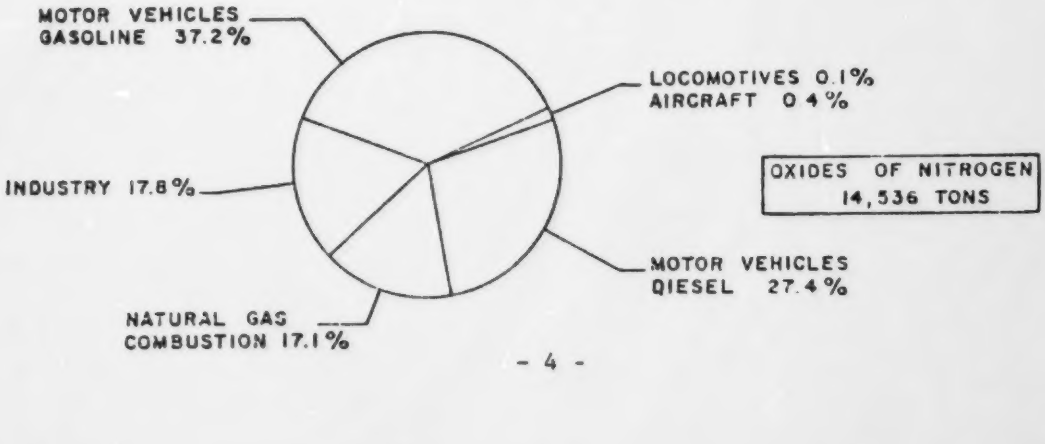
The major air quality monitoring station in the downtown is situated in the J. J. Bowlen Building, located at 6 St. and 7 Ave. S.W.. The air inlet is situated at a height of 10 meters above grade; the building itself is 30 meters high. The station is capable of monitoring the following pollutants: SO_2, NO_x, O_x, CO and THC. In addition, a high-volume sampler is located atop the roof of the City of Calgary Police Station, 316-7 Ave. S.E.. The sampler is positioned approximately 35 feet above street level.

The following discussion presents a precis of the information in a recent Alberta Environment publication (Alberta Environment, 1975) dealing with air pollutant sources and levels in downtown Calgary.

B. Pollutants

1. Oxides of Nitrogen

The oxides of nitrogen are composed of two major constituents; nitrogen dioxide (NO_2) and nitric oxides (NO). Essentially, both pollutants are a product of the high temperature (in excess of 2000 ^{o}F) oxidation of atmospheric nitrogen. Although the NO_2 emission is usually less than 0.5% of the total oxides of nitrogen, exhaust gas dilution and subsequent oxidation as well as photochemical oxidation give rise to NO_2 production. The source and omission inventory illustrated below indicates that motor vehicles account for more than half of the oxides of nitrogen emissions.



Epidemiological studies of the effect of nitrogen dioxide on community health have shown a significant correlation with increased respiratory disease at mean 24-hour concentrations between 117 and 205 ug/m_3 (0.062 and 0.109 ppm). These NO_2 levels constitute the lower documented pollutant effect range and care should be exercised in the data interpretation since synergistic effects from other air pollutants may be involved. The monitored NO_2 and NO_x levels in the city of Calgary indicate that daily averages in excess of 0.06 ppm were recorded periodically, particularly during the winter months, and therefore existing nitrogen dioxide levels constitute a potential health hazard, especially to sensitive individuals. Generally, the toxicological effect of NO is minimal when compared to NO_2.

2. Ozone

The production of ozone results from a photochemical oxidation process involving the interaction of nitrogen oxides, ultraviolet light energy and reactive hydrocarbons. It was found that the downtown area station, CDMU, recorded a low frequency of violations and relatively low ozone levels.

3. Total Hydrocarbon (THC)

The source/emission information indicates that motor vehicles are the primary source of hydrocarbon emissions in Calgary.

Hydrocarbons receive the most important consideration as precursors of other compounds formed in the atmospheric photochemical system. Although air quality standards do not presently exist for hydrocarbons (as there has been no demonstration of any direct health effects of the gaseous hydrocarbons in ambient air on populations), it is widely suspected that many of the effects attributed to photochemical smog are indirectly related to ambient levels of these hydrocarbons.

The highest THC levels have been monitored at the downtown area station, CDMU. However, Alberta Environment suggests that present information is insufficient to conclude that existing hydrocarbon levels in the city present a general health hazard.

4. Carbon Monoxide (CO)

On a total mass emission basis carbon monoxide is by far the most abundant pollutant, comprising 73% of the total air pollution emissions in Calgary. Motor vehicles contribute almost all of the carbon monoxide and, consequently, it is not surprising that in comparing data from the city's three continuous monitoring stations, one finds the highest frequency of violations at the downtown area station, CDMU, both on an hourly and 24-hour basis. Further, CO levels were generally higher in the fall and winter months, with all of the readings in excess of provincial air quality standards being recorded during this period.

The health effect of carbon monoxide at low concentrations manifests itself primarily in the production of carboxyhemoglobin (COHb) levels in the blood; levels which have been associated with impaired performance on psychomotor tests*. As carbon monoxide is inhaled it joins with hemoglobin present in the lungs to form carboxyhemoglobin. Hemoglobin is used by the body to deliver oxygen to body tissues and, as a greater proportion of the available hemoglobin is combined with carbon monoxide, a decreasing proportion is available for the delivery of oxygen, hence, less oxygen is circulated to the body's tissues. Impaired time interval discrimination was noted with an exposure of 8 or more hours to a CO concentration of 12-17 mg/m^3 (10-15 ppm) with an associated COHb level of 2.0 to 2.5% in non-smokers. It should be remembered that cigarette smokers generally have a COHb level with a median value of 5%; whereas non-smokers, in air which has very little CO, are usually found to have about 0.5% COHb.

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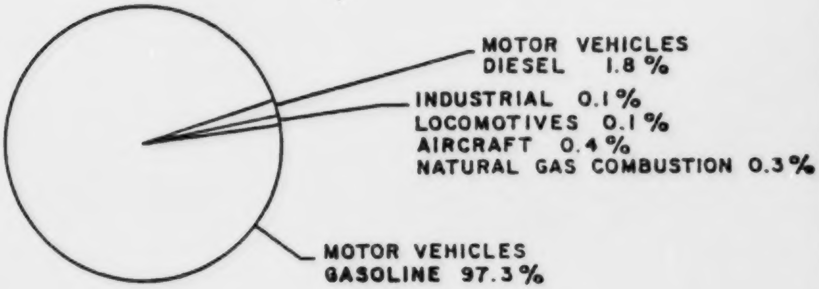
*Quoted from "Air Quality Criteria for Carbon Monoxide", U.S. Department of Health, Education and Welfare, Publication #AP-62.

The source and emission inventory illustrated below indicates that motor vehicles accounted for approximately 97.3% of all CO emissions in Calgary in 1973.

RELATIVE CONTRIBUTION OF EACH CATEGORY TO TOTAL CARBON MONOXIDE EMISSIONS IN THE CITY OF CALGARY 1973

CARBON MONOXIDE 138,098 TONS



6. Particulates (Soiling Index, Hi-Volume, Total Dustfall)

Particulate matter in the atmosphere is composed of a large variety of substances, and encompasses any matter dispersed in the air, whether solid or liquid, in which the individual particles are larger than small molecules but smaller in diameter than 500 microns. The source emission information for the Calgary area indicates industry to be the prime source of particulate emissions. It should be remembered, however, that dust from natural sources such as wind erosion or dust related to construction activities is not considered in the source emission information.

With regard to suspended particulates, data monitored by use of high-volume samplers indicate that the highest suspended particulate levels were obtained in the downtown area and the lowest levels in the residential areas. On an annual geometric mean basis the downtown area station and the industrial area station were in excess of the provincial annual standard of 60 ug/m^3 and almost twice the level monitored at the residential area stations.

Based on the existing high-volume suspended particulate levels in Calgary and available effect information, one can conclude that the higher levels constitute a nuisance potential but are not a health hazard due to the fact that monitored sulfur dioxide levels are relatively low.

C. Air Quality Index

In order to provide the public with a simple, readily comprehensible indication of downtown air quality on a daily basis an air quality index was developed in 1972. The report is released to the media on a daily basis using air monitoring data from the downtown area station, CDMU. Although a certain amount of oversimplification is inherent in any air quality index, it does relate downtown air quality to provincial standards and can serve a useful purpose as a public information vehicle.

Air monitoring data from the downtown area for September, October and November, 1975 have been presented in Table 1. Data are given for monthly mean, hourly peak and daily peak readings. With the possible exception of ozone, pollutant concentrations generally tend to increase from September to November. As would be expected, hourly peak levels generally exceed daily peaks, which in turn exceed monthly peaks. In the final column, Alberta air quality standards for each pollutant are given. This information clearly illustrates that downtown air pollutant concentrations do exceed the provincial standards by a very substantial margin. In the air monitoring report which discusses the data given in Table I, it was noted that for the three month period the following standards were exceeded:

Total Oxides of Nitrogen

September- twenty six, 1 hour averages and five, 24 hour averages exceeded their respective provincial standard

October - fourty six, 1 hour averages and five, 24 hour averages exceeded their respective provincial standard

TABLE 1
AIR MONITORING DATA
DOWNTOWN CALGARY
SEPTEMBER, OCTOBER AND NOVEMBER, 1975

POLLUTANT	MONTHLY MEAN (ppm)			HOURLY PEAK (ppm)			DAILY PEAK (ppm)			ALBERTA STANDARD
	Sept.	Oct.	Nov.	Sept.	Oct.	Nov.	Sept.	Oct.	Nov.	
Total Oxides of Nitrogen	0.09	0.08	0.11	0.54	0.50	0.69	0.13	0.24	0.41	1 hr: 0.21 ppm 24 hr: 0.11 ppm
Ozone	0.01	0.01	0.01	0.05	0.04	0.03	0.02	0.03	0.01	1 hr: 0.05 ppm 24 hr: 0.015 ppm
Reactive Hydrocarbons	0.20	0.34	0.43	1.00	2.10	3.10	0.50	0.73	1.40	
Carbon Monoxide	2.60	2.9	3.40	17.0	20.0	28.0	4.40	5.50	12.0	1 hr: 13.0 ppm 8 hr: 5.0 ppm
Sulphur Dioxide	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.01	½ hr: 0.20 ppm 1 hr: 0.17 ppm 24 hr: 0.06 ppm
Alberta Combined Air Quality Index	7	8	10	33	56	66	12	20	31	

Source: Calgary Air Monitoring Report, Fall Quarterly Summary, September, October and November, 1975, Station CDMU, Pollution Control Division, Alberta Environment, 1976.

November - one hundred and ten, 1 hour averages and twelve, 24 hour averages exceeded their respective provincial standard

Ozone

September - two, 1 hour averages and three, 8 hour averages exceeded their respective provincial standard

October - three, 1 hour averages and nine, 8 hour averages exceeded their respective provincial standard

November - twenty one, 1 hour averages and fourteen, 8 hour averages exceeded their respective provincial standard

Suspended Particulates

September - two out of three, 24 hour samples exceeded the provincial standard with a peak of 220 micrograms per cubic meter

October - two out of three, 24 hour samples exceeded the provincial standard with a peak of 234 micrograms per cubic meter

November - three out of three, 24 hour samples exceeded the provincial standard with a peak of 276 micrograms per cubic meter

In considering these observations one must bear in mind that because of the monitoring apparatus being positioned 10 meters above grade the concentrations of pollutants at grade may be significantly higher. For example, in Smith's study it was found that "on all 24 days for which hourly street CO measurements were made, street levels of CO exceeded levels of CO measured by the downtown monitor of Alberta Environment " (Smith, 1975, pg. 5). In their study of carcinogenic hydrocarbons, Peak and Black noted that;

> "Under average wind conditions in Calgary of 10 mph there is rapid mixing and dispersion of PAH pollutants in the downtown area so that concentrations at the third floor building level are three to four times less than at the street level". (Peak and Black, 1975, pg. 57).

further, Smith also observed that: (Smith, 1975, pg. 6)

> "While not fluctuating as much as the street levels, the CO levels inside downtown buildings remained, on the average

well above the ambient levels measured at the fourth floor level for the same day by the downtown monitor of Alberta Environment."

III. CARBON MONOXIDE*

A. PROJECT DESCRIPTION

A study of both indoor and outdoor carbon monoxide (CO) exposure was conducted in Calgary, Alberta, from September, 1973 through March, 1974. Two areas of the city, with very different ambient CO exposure conditions, the suburban campus of the University of Calgary and the central business district, were studied as well as a special group with occupational exposure, i.e. automobile parkade employees.

The presence of carbon monoxide (CO) in the lower atmosphere or ambient air is a potential hazard for large urban centers such as Calgary because of the high density of motor vehicle traffic, (the source of 97% of the outdoor exposure to carbon monoxide in this city (Western Research, 1973)). Besides CO produced by incomplete combustion of motor fuel, the urban resident is exposed to CO in cigarette smoke and to some degree in private houses from fuel fired heating and cooking. Furthermore, occupations have developed, such as automobile mechanic and auto parkade attendant, in which individuals are exposed to higher concentrations of CO from motor vehicle exhaust than are found in outdoor air.

Concern over CO exposure in the urban environment grows as data accumulates, indicating that very low levels of CO, 15-20 ppm, sufficient to cause 2.5 to 3.0% carboxyhemoglobin (hemoglobin combined with CO, abbreviated as COHb) at equilibrium, can produce undesirable health effects, particularly to those individuals already impaired by cardiovascular disease (Aronow, 1972; Aronow and Isbell, 1973; Anderson et al, 1973).

Because of these concerns, the primary objective of this paper is to present data to assess and compare the importance of both indoor and outdoor CO exposure in several urban groups in Calgary, Alberta:

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* The following description is a precis, taken verbatim, from N. Smith, C. A. Guenter, G. Hodgson, "Community Exposure to Carbon Monoxide in Calgary, Alberta", Environmental Science Centre (Kananaskis) and the Faculty of Medicine, University of Calgary, 1974.

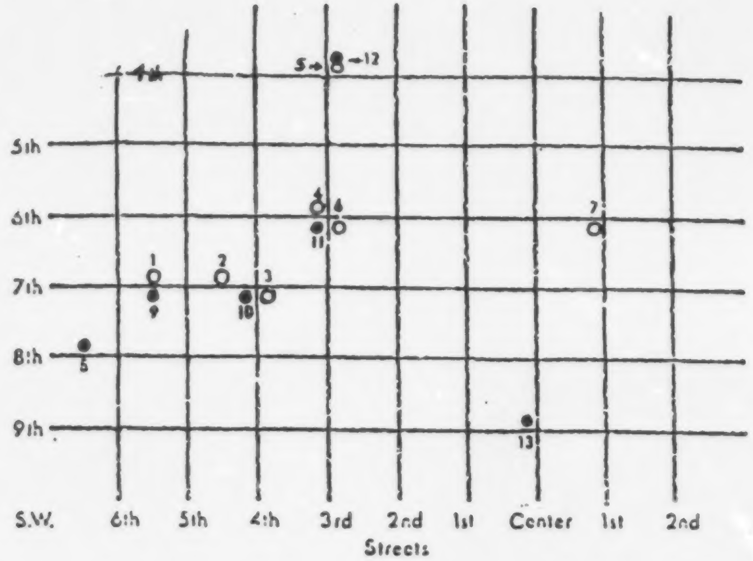
(a) Persons exposed to the highest amounts of outdoor and indoor ambient CO--office and store personnel in the downtown area of Calgary.

(b) Persons exposed to a presumed minimal amount of outdoor and indoor ambient CO during the working day--students and employees in a suburban setting, the University of Calgary.

(c) A special group with occupational exposure--automobile parkade employees.

Measurements of carbon monoxide in the ambient air were made continuously inside buildings and by hourly spot checks at the adjacent street level for thirteen locations (Figure 1) for three days each in the central business district. Comparable measurements were also made seven days on the campus of the University of Calgary. Testing was conducted during the fall and winter seasons of 1973-74 (with some additional tests in 1974-1975).

Sequential hourly sampling of expired air was conducted for employees during the eight hour work day at each of the work sites. In addition employees of two parkades, a university laboratory and a downtown office building were asked to give an expired air sample one morning both before smoking and before leaving their home.



○ Buildings, 1-7

● Automobile parkades, 8-13

Fig. 2. Location of Testing Sites in the Central Business District of Calgary.

1. Eleven story office building, central air conditioning, sealed windows, air intake for first floor measuring site located on third floor, air intake for fourth and tenth floor measuring sites located above eleventh floor.

2. Two story museum, no central air conditioning, unsealed windows, air intake fan located at ground level on north side of building to ventilate basement. Measurement sites: basement, first and second floor.

3. Four story department store connected to parkade by understreet walk way, separate air intake for each floor except basement located at ceiling height for each floor along 7th Avenue. Air intakes for basement located at roof level, unsealed windows. Measurement sites: basement, first, mezzanine, second and fourth floors.

4. Seven story office building, central air conditioning, sealed windows, air intake located at equivalent height of nine floors. Measurement sites: first, fourth, and seventh floors.

5. Seventeen story (minus thirteenth floor) hotel, central air conditioning, sealed windows, air intake for second through seventeenth floors located above seventeenth floor; for second floor banquet room, lobby and part of lower shop area located at second floor, for ground floor at street level. Measurement sites: ground floor, lobby, fourth and sixteenth floors.

6. Six story older office building, no central air conditioning, unsealed windows. Primary measurement sites at two locations on ground floor. Ambient air samples also taken on second, fourth, and sixth floors.

7. Two story older office building, no central air conditioning, unsealed windows. Measurement sites on first, and second floors.

8. Automobile parkade, covered, above ground, 250 stalls.

9. Automobile parkade, covered above ground, 320 stalls.

10. Automobile parkade, covered, above ground, 300 stalls.

11. Automobile parkade, covered, above ground, 178 stalls.

12. Automobile parkade, underground, 275 stalls.

13. Automobile parkade, covered, above ground, 455 stalls.

FIGURE 1: LOCATION OF TESTING SITES IN THE CENTRAL BUSINESS DISTRICT OF CALGARY

In order to estimate CO exposure while employees were in transit to these sites, CO levels were measured inside buses and automobiles in rush hour traffic during December and January.

CO levels were measured each day inside the City of Calgary transit buses at five minute intervals during round-trip transit from the University of Calgary to downtown Calgary and for both daily rush hours and mid-day for two weeks in December and two weeks in January.

B. OBSERVATIONS

1. Exposure to Ambient Air Outside

Street levels of carbon monoxide (CO) downtown exceeded the Alberta one-hour standard of 13 ppm (Table 2) and the 8 hour standard of 5 ppm for 23 out of the 24 days tested for 8 hour average CO levels (Alberta Department of the Environment, November, 1973).

The peak downtown hourly average (on the basis of 5 spot samples ranging up to 125 ppm) was 71.5 ppm, which occurred on January 21, 1974, between 5:00 p.m. and 6:00 p.m. on Ninth Avenue between Center Street and First Street S.W.

In general, peak levels were measured in December and January. For five of the fifteen days tested during these months, levels of CO in the downtown area reached concentrations that could produce health effects: daily average levels of 18-20 ppm with peak measurements of CO in the afternoon's heavy traffic flow of 35-50 ppm lasting one to two hours. In contrast, throughout most of the testing period of mid-September to mid-February, street levels of CO generally were lower with average daily levels less than 10 ppm and rush hour peaks measuring 15-20 ppm.

TABLE 2: EXPOSURE TO CO(ppm) BY LOCATION

Location	8-Hour Average			Peak Hourly Average
	Mean ± SD	N*	Range	
Parkade Ticket Booth	33.3 ± 15.9	14	16.8–65.2	240.0
Mechanics'Work area-Parkade	63.0 ± 29.8	6	27.0-107.9	250.0
Office-Store-Interior	7.7 ± 3.3	14	3.0–15.0	35.0
Street-Central City	7.6 ± 13.1	24	5.2–24.4	71.5
University Office-Lab	2.7 ± 1.5	7	1.5–5.0	18.0
Street-University	3.0 ± 1.8	7	1.6–6.0	19.0
Rural-Kananaskis Valley	<0.5	2	0 – 0.5	0.5

*Number of 8-hour averages, the average concentration of CO over the eight hour work day.

TABLE 3: EFFECTS OF THE LEVEL OF AIR INTAKE ON THE CONCENTRATION OF CO - FRIDAY, DECEMBER 21, 1973, BETWEEN 5:30 - 6:00 p.m.

Site	Building Type	CO Level by Floor (ppm)
2	Two story older museum No central air conditioning.**	12 ppm, floor 1 and 2
3	Four story older department store. Air intake for each floor located on each floor-ground floor intake on roof, but connected by tunnel to parkade.	Ground 1st 2nd 3rd 4th 50 34 22 24 22 Rest area for customers on ground floor: 72
6	Six story older office building. No central air conditioning.**	1st 2nd 4th 6th 23 25 20 19
4	Seven story modern office building. Air intake on roof.	1st 4th 7th 20 17 18
*	Fifteen story modern office building. Air intake on roof.	1st 7th 15th 8 7 7

2. Indoor Levels of Carbon Monoxide

Offices and stores in the central business district had much lower levels of CO than parkades, although higher than the University of Calgary (Table 2). Their mean 8 hour CO, level 7.7 ppm, was slightly above the Alberta standards. However, both the peak 8 hour average of 15.0 ppm (out of a range of 3.0 to 15.0 ppm); and the peak hourly average, 35.0 ppm (measured at ground level, location 6), were above the Alberta standards for ambient air and sufficient to pose a potential health problem to persons with heart disease. Peak levels of CO in buildings were also found in December. For example, between 4:00 and 7:00 p.m. in the Christmas week, bag samples of room air measured between 15 and 30 ppm CO in four buildings tested that week on Sixth and Seventh Avenues as compared to previous high readings of 12 to 18 ppm.

Data collected during December suggest the effect of height of the air intake and type of ventilation on severity and uniformity of CO levels reached in each building (Table 3). The first three buildings are older, lack sealed windows, and freely admit ambient air at each floor. The difference in their readings relates to the noticeable difference in traffic density at their respective locations. The latter two are modern high rise buildings. The difference between the two groups relates to a difference in the levels of their air intakes (in both cases above the top floor). These findings were confirmed by measurements in the six-story older building and the seven-story modern structure located on the same busy intersection. The consistently higher levels of CO in the lower floor of the older building reflected again the lack of sealed windows, in effect a ground floor level air intake.

One particularly serious ventilation problem involved the basement floor of a building connected to a parkade across the street by an underground tunnel. The tunnel served as a natural conduit allowing the automobile exhaust fumes to enter the building. A rest area with chairs linked the tunnel with the building. Here brief measurements by the continuous monitor showed CO concentrations of 175 ppm for 10 minutes and 90 ppm for two separate spans of one hour. Spot checks by sample bags in this area ranged from 20-100 ppm CO.

Figure 2, showing hourly averages determined from fourteen days of data, demonstrates how room air in these buildings closely followed the outside ambient levels of CO. While not fluctuating as much as the street levels, the CO levels inside downtown buildings remained on the average well above the ambient levels measured at the fourth floor level for the same day by the downtown monitor of the Alberta Department of the Environment. The morning peak was particularly pronounced for all three sources of data.

3. Parkades: An Example of Special Occupational Exposure

Parkades measured the highest levels of CO as compared to other building types: a mean 8 hour level of 35.3 ppm in the ticket collection booth (referred to as "room" in all figures) of six parkades with a standard deviation of 15.9 ppm, a range of 16.8 to 65.2 ppm, and a peak hourly average of 240 ppm (Table 2). Out of 14 days of testing in the six parkades, four days (two in January, two in October) in the ticket booths of three parkades measured 50 ppm or more for an 8 hour average.

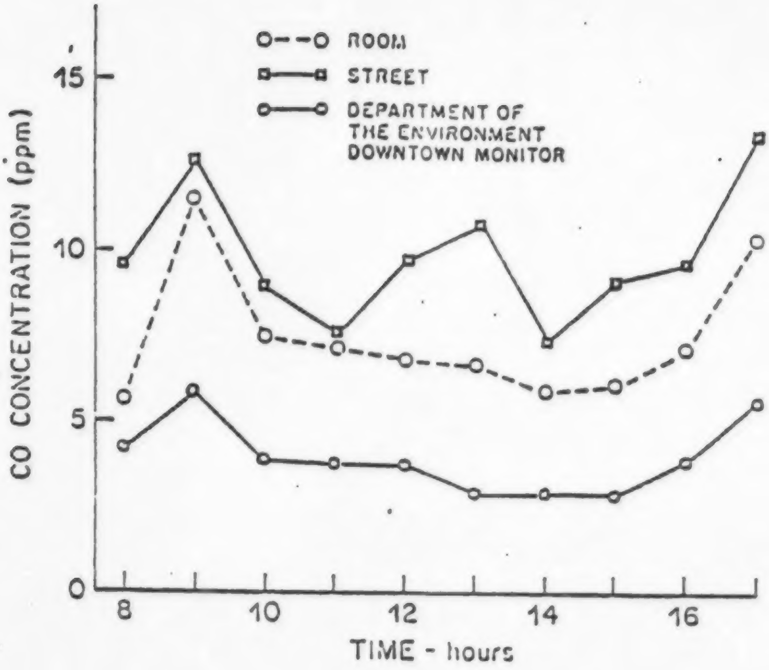


Fig. 5. Average CO levels during the work day in downtown Calgary for the interior (Room) of office buildings and stores, for street level outside these buildings, and for the Calgary downtown CO monitor of the Alberta Department of the Environment. Each data point represents an average of 14 days of data for that hour, September through December, 1973.

FIGURE 2: AVERAGE CO LEVELS DOWNTOWN IN SPECIFIC LOCATIONS

Moreover, areas where mechanics worked on automobiles measured still higher, even though mechanical exhaust systems were present in each area. Here the mean 8 hour CO level was 63.0 ppm with a standard deviation of 29.8 ppm, a range of 27.0 ppm. Measurements of CO on 6 out of 10 days in the work areas of auto mechanics reached 50 ppm or more for an 8 hour average. Figure 3 represents the average hourly levels of CO using data from all the parkades tested. It shows a minor morning and noon rise and a major rise of CO concentrations in the evening.

4. Exposure to CO in Buses and Automobiles

Employees in Calgary expose themselves to considerable CO while travelling to work. During ten twenty-minute automobile trips, the automobile interior averaged 31.5 ± 6.0 ppm going to work and 26.2 ± 2.0 ppm going from work with a peak average of 66.7 ppm (45 minute trip). The 45 minute trip included a 20 minute period in a traffic jam during which the interior level of CO continuously exceeded 100 ppm. Bus trips were lower and ranged in averages from 10.1 ± 6.3 ppm for four trips going from the city center in the morning to 19.5 ± 9.5 ppm for 12 trips going from the city center at the evening rush hour.

5. COHb Levels in Employees

Smokers in the office buildings averaged three times as much COHb in their blood as nonsmokers. The mean of their respective eight-hour averages was 5.8 ± 2.3 and 1.7 ± 0.6 with a range of 2.1 - 11.1 and 1.0 - 3.4% COHb respectively (Table 4). Their respective end-workday average levels were 6.8 ± 2.2%, range

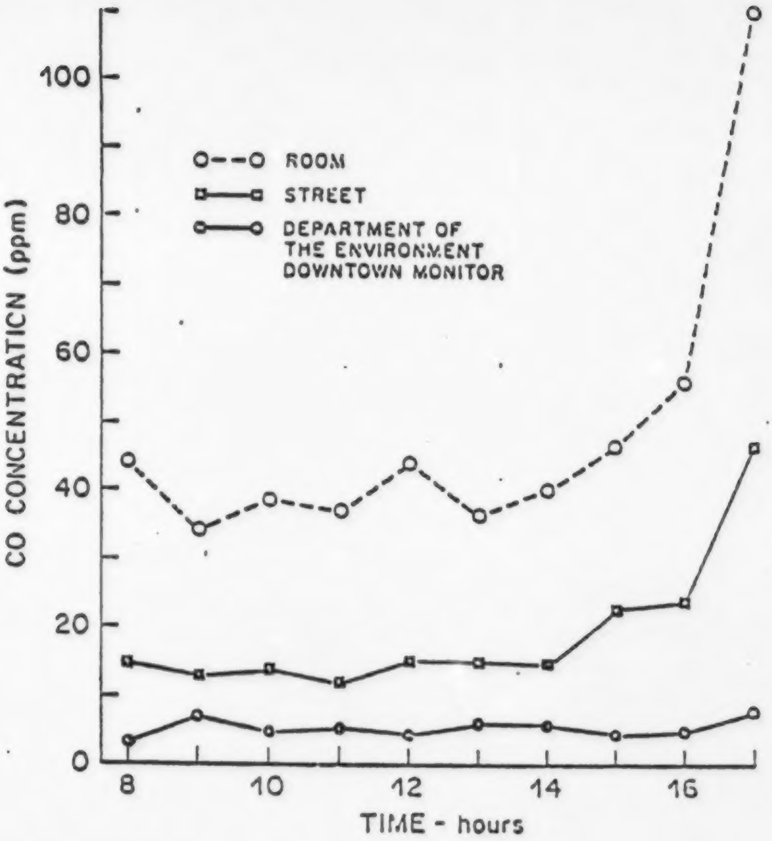


Fig. 8. Average CO levels during the work day in downtown Calgary for room air in the ticket booths of automobile parkades, for street level outside these buildings and for the downtown Calgary CO monitor of the Alberta Department of the Environment.

Each data point represents an average of 14 days of data for that hour, September, 1973, through February, 1974. Note that each data point for level of CO in the room air and the ambient air measured by the Alberta Department of the Environment is not an average spot reading, as street level is, but represents the mean CO level for the preceding 60 minutes determined from a continuous record.

FIGURE 3: AVERAGE CO LEVELS DOWNTOWN - PARKADES

TABLE 4: CARBOXYHEMOGLOBIN LEVELS (% COHb) DETERMINED BY ANALYSIS OF EXPIRED AIR FOR OCCUPATIONAL GROUPS

A. COHb Levels (%).

Exposure Group	8-Hour Averages**			Changes in COHb Between Morning and Evening. Over 8-Hour Work Day		End Work Day Levels of COHb		
	Mean ± SD	N*	Range	Mean ± SD	Range	Mean ± SD	N*	Range
Parkade Employees								
Smokers	8.5 ± 3.0	19 x 2	3.6 - 16.9	4.5 ± 3.9	0.0 - 16.2	10.5 ± 5.1	19 x 2	3.6 - 23.6
Nonsmokers	4.6 ± 2.3	10 x 2	2.7 - 9.5	3.2 ± 4.3	1.1 - 10.6	6.9 ± 3.4	10 x 2	2.6 - 13.2
Office-Store Employees				Pre-December	Pre-December			
Smokers	5.8 ± 2.3	33 x 2	2.1 - 11.1	0.0 ± 1.7	-3.2 to 4.5	6.6 ± 2.2	31 x 2	2.0 - 15.3
Nonsmokers	1.7 ± 0.6	47 x 2	1.0 - 3.4	-0.1 ± 0.9	-3.0 to 2.9	1.7 ± 0.7	47 x 2	1.0 - 3.8
				December	December			
			Smokers	1.0 ± 2.0	-4.0 to 4.2			
			Nonsmokers	0.4 ± 0.8	-1.1 to 2.3			
University								
Smokers	4.1 ± 3.0	9 x 7	1.9 - 9.6	0.2 ± 1.3	-1.1 to 3.2	4.6 ± 3.5	9 x 7	1.8 - 10.9
Nonsmokers	0.9 ± 0.2	9 x 7	0.8 - 1.3	-0.1 ± 0.3	-0.7 to 2.3	1.0 ± 0.3	9 x 7	0.6 - 1.7

N = Number of employees times the number of days of testing for each employee to give the total number of 8-hour averages used to determine the mean.

** A single 8-hour average equals the average concentration of COHb in the blood of an employee over an eight hour work day.

2.0 - 15.3% and 1.7 ± 0.7% COHb, range 1.0 - 3.8%. Figure 4 illustrates the levels of CO attained by a smoker and a nonsmoker in an older building on the ground floor at a busy intersection. The expired air of the smoker remained well above that of the room air and close to 15-20 ppm (3.4% COHb) higher in COHb than the nonsmoker throughout the day. Thus the smoker was actually adding to the CO level in the air. At the end of the workday, 80 percent the smokers had COHb levels greater than 5% and only 8 percent of greater than 10%. Smoking parkade employees on the average had twice the CO in their blood as did nonsmokers, 8.5 ± 3.0% COHb as compared to 4.6 ± 2.3% COHb for an 8 hour average.

C. CONCLUSIONS

As the data and discussion above suggest, nonoccupational, nonsmoking exposure in Calgary is probably no immediate problem for healthy people. However, ambient street levels and interior levels of CO occasionally occur in the downtown area that can produce 2.5 to 3% CPHb. This range of COHb levels does have possible health consequences to the people with cardiovascular disease. Peak CO levels measured at street level, inside buses and particularly automobiles, inside parkade ticket booths and auto repair areas, and on the ground floors of unsealed buildings in downtown Calgary were sufficiently elevated to be a health hazard to older persons with latent heart disease. Late afternoon winter street levels of CO rose frequently to 35 - 40 ppm for up to two hours with a peak hourly level of 72 ppm. Data for COHb and CO levels also indicatedthat CO exposure either on the street or inside buildings is not a health problem for suburban areas of Calgary with the same CO exposure as measured at the University of Calgary; smoking was the primary CO exposure. For smokers in parkades, the data suggested that smoking and occupational exposure are probably equally important sources of CO. Parkade levels of CO (as much as 240 ppm) indicated the need for serious revision of ventilation requirements in parkades.

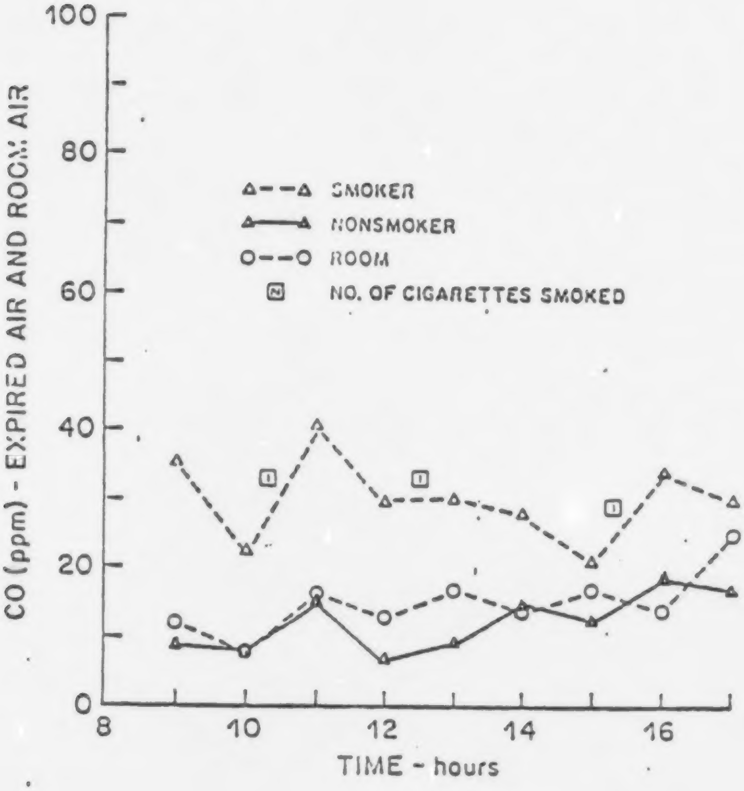


Fig. 10. The CO levels of the room air and of the expired air of a smoker and a nonsmoker - office building (no central air conditioning), 6th Avenue and 3rd Street, S.W., September 24, 1973.

FIGURE 4: CO LEVELS - SMOKERS AND NON-SMOKERS

For all groups both environmental and smoking exposure to CO were additive. However, environmental CO exposure was primarily important to nonsmoking employees of the office buildings and stores in the downtown area. This exposure was due to the elevated CO levels in buses and particularly automobiles during rush hour traffic and to CO-laden street level air seeping into older buildings and occasionally into the intake vents of the newer high rises. Most of the time (95%) nonsmokers were well below the 3% COHb level at which impairment of coronary heart disease patients or psychomotor changes begins.

Carbon monoxide exposure has been examined* in four occupations which involve extensive time spent driving on city streets: bus and taxi drivers, policemen, and commissionaires (parking ticket officers). In general, number of cigarettes smoked per day and the amount of time since one last smoked had the greatest effect of carboxyhemoglibin (COHb) levels. Differences among bus drivers in hours spent driving or outside correlated poorly with differences in end-working COHb levels but did explain part of the variance in COHb levels in police constables. COHb levels tended to be inversely related to age. Nonsmoking bus drivers had levels of COHb, less than 2.0% COHb, comparable to those found by a previous study in office workers and clerks in the downtown area of Calgary. Nonsmoking police and taxi drivers had higher COHb levels, averaging between 2.5 to 3.5%, the level at which people with cardiovascular disease begin to experience measurable adverse effects. This finding was in agreement with the more elevated CO levels previously found in automobiles as compared to buses. All four driving occupations had average COHb levels in nonsmokers ranging from approximately 2 to 3 times the average levels measured both previously and in this study in nonsmoking personel at the suburban university of Calgary. Peaks close to 5% COHb in both taxi drivers and policemen were within the range reported in the literature which measurably affected the psychomotor responses of healthy individuals and seriously affected the cardiac performance of those with cardiovascular disease. Because of the large number of taxi drivers over 40 years old, this finding is a concern. The majority of commissionaires (86%), bus drivers (55%) and taxi drivers (76%) were present smokers as compared to less than 50% for the general Canadian adult population (47% for males, 32% for females). As a result of smoking, taxi drivers had peak levels of 12.0% COHb, bus drivers 11.0%, and policemen 14.6%. Smokers in most of the occupations tested averaged approximately 20 cigarettes per day, while commissionaires averaged 30. The average age for starting to smoke was 15-17 for all smokers. Thus because of the large number of smokers the risk of developing heart disease is already elevated in these occupations. Additional CO exposure due to chronic exposure to auto exhaust may increase the risk of developing heart disease and adversely affect oxygen supply to the tissues.

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* Smith, Dr. Nancy Johnson, Occupational and Community Exposure to Carbon Monoxide in Calgary, Alberta, Part II: Motor Vehicle Oriented Occupations, Calgary, Environmental Sciences Centres (Kananaskis), University of Calgary, November, 1975.

IV. CARCINOGENIC HYDROCARBONS*

A. PROJECT DESCRIPTION

Chemicals in the workplace, the environment, and in the diet may be the single most important cause of human cancers (Maugh, 1974b). It is apparent that the vast effort of the past few years to develop cures for cancer has made only limited progress. Attention is now turning to other means of attacking the problem; to the causes of cancer, and particularly to chemical carcinogenesis. Scientists estimate that 60-90% of cancers are caused by environmental factors--mostly chemicals.

Epidemiological research has shown a clear statistical relationship between the incidence of non-occupational lung cancer and geographical areas of high air pollution such as the industrial and downtown areas of cities (Carnow and Meier, 1973). Urban air pollution has been implicated in the high rate of cancer in cities but due to the complex nature of the problem little definitive data are available on the exposure of urban dwellers to atmospheric carcinogens. This study provides such data for the inhabitants of Calgary.

In the atmosphere of the city center the internal combustion engine causes 99% of the carbon monoxide and likely a similar percentage of the PAH comes from this source. In an Alberta Environment (1971) report it was estimated that 70.9% of the hydrocarbon emissions in Calgary were due to the internal combustion engine.
Thus the downtown business district with its high density of traffic, average of 127,400 vehicles from 7:00 a.m. - 11:00 p.m. on each weekday during May of 1975 (Calgary Planning Department), acts

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* The following description is a precis, taken verbatim from, Peak, Eric and Black, Karen, "Carcinogenic Hydrocarbons As Pollutants in the Atmosphere of the City of Calgary", Calgary, Environmental Science Centre (Kananaskis), University of Calgary, 1975.

as almost a point source of pollutants which under light wind conditions may move into the residential areas of the city primarily following the Bow River valley but also moving north along the Nose Creek valley (Figure 5).

The sampling method adopted in this study is widely used throughout North America. Atmospheric particulate matter is collected on a fiber glass filter and associated polycyclic aromatic hydrocarbons are then investigated. The backbone of the sampling program was a network of four sampling sites operated by Alberta Environment at locations shown on the City of Calgary planning map of Figure 6 and the topographic map of Figure 5. The four sites were:

(1) a downtown location - the roof of the City of Calgary Police station, 316 7th Avenue S.E. Sampler located about 35 feet above street level on the eastern edge of the main downtown core.

(2) an industrial location - at ground level of the Ogden meteorological tower in east Calgary. The meteorological tower is located well away from any specific sources of pollutants in a field at approximately 45th Avenue and Bonnybrook Road S.E.

(3) a residential location - at ground level in the back yard of a residence at 407 - 31 Avenue N.W. in north Calgary.

(4) a residential location - on the roof of a trailer - 10 feet above ground level at the meteorological site on the University of Calgary campus in west Calgary.

In addition to these sites, samples were taken using equipment from the Environmental Sciences Centre (Kananaskis) at:

(5) a downtown location - at street level outside the J.J. Bowlen building on the northwestern edge of the downtown core.

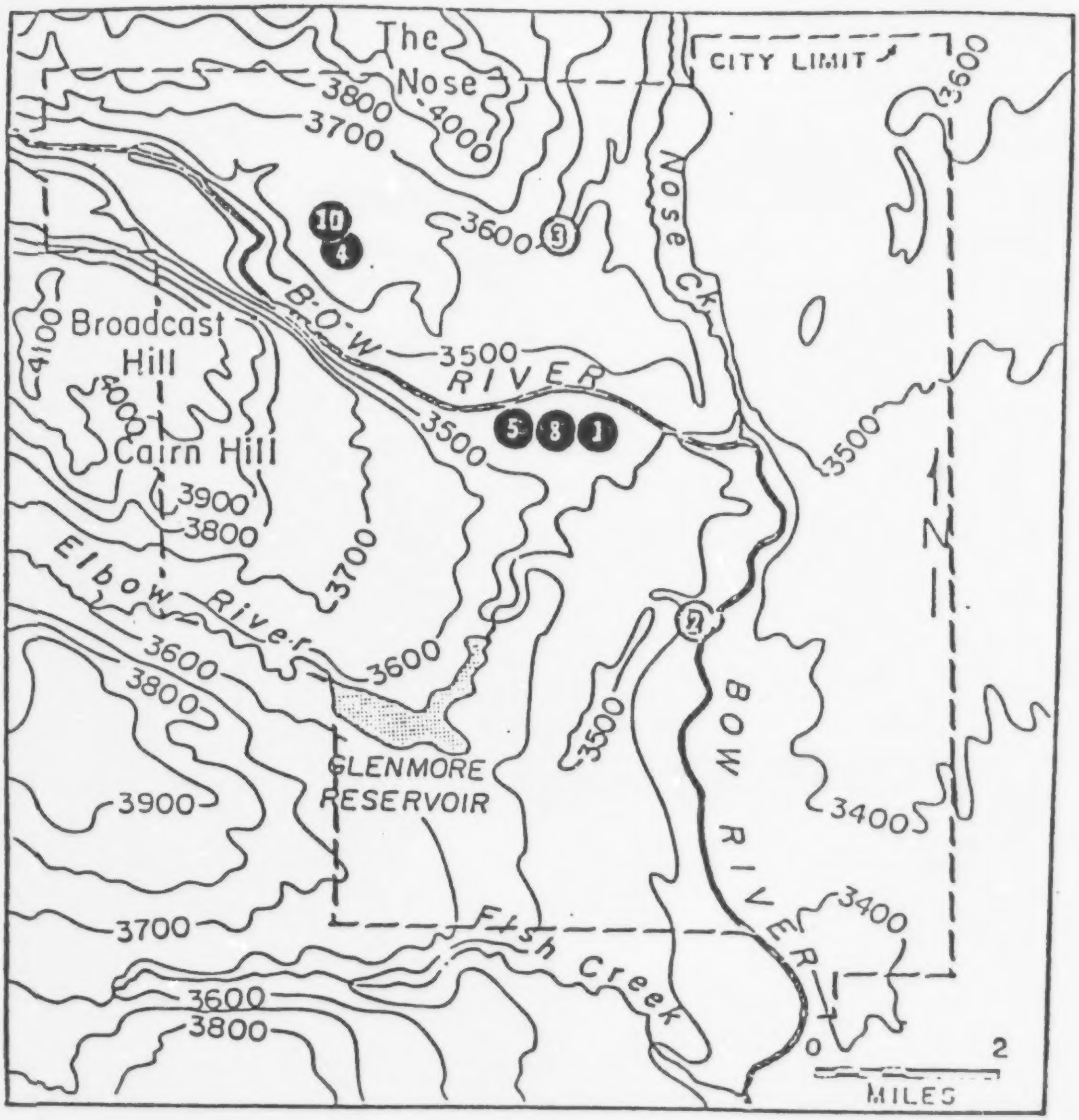
The Nose
3800
4000
3700
CITY LIMIT
3600
10
4
3600
3
Nose Ck.
Broadcast Hill
4100
4000
Cairn Hill
B·O·W
3500
RIVER
5
8
1
3500
3500
3900
3800
3700
Elbow River
3600
3600
3800
2
3500
BOW RIVER
GLENMORE RESERVOIR
3900
3400
3400
3700
Fish Creek
3600
3800
0
2
MILES

FIGURE 5: SAMPLING SITES AND CALGARY TOPOGRAPHY

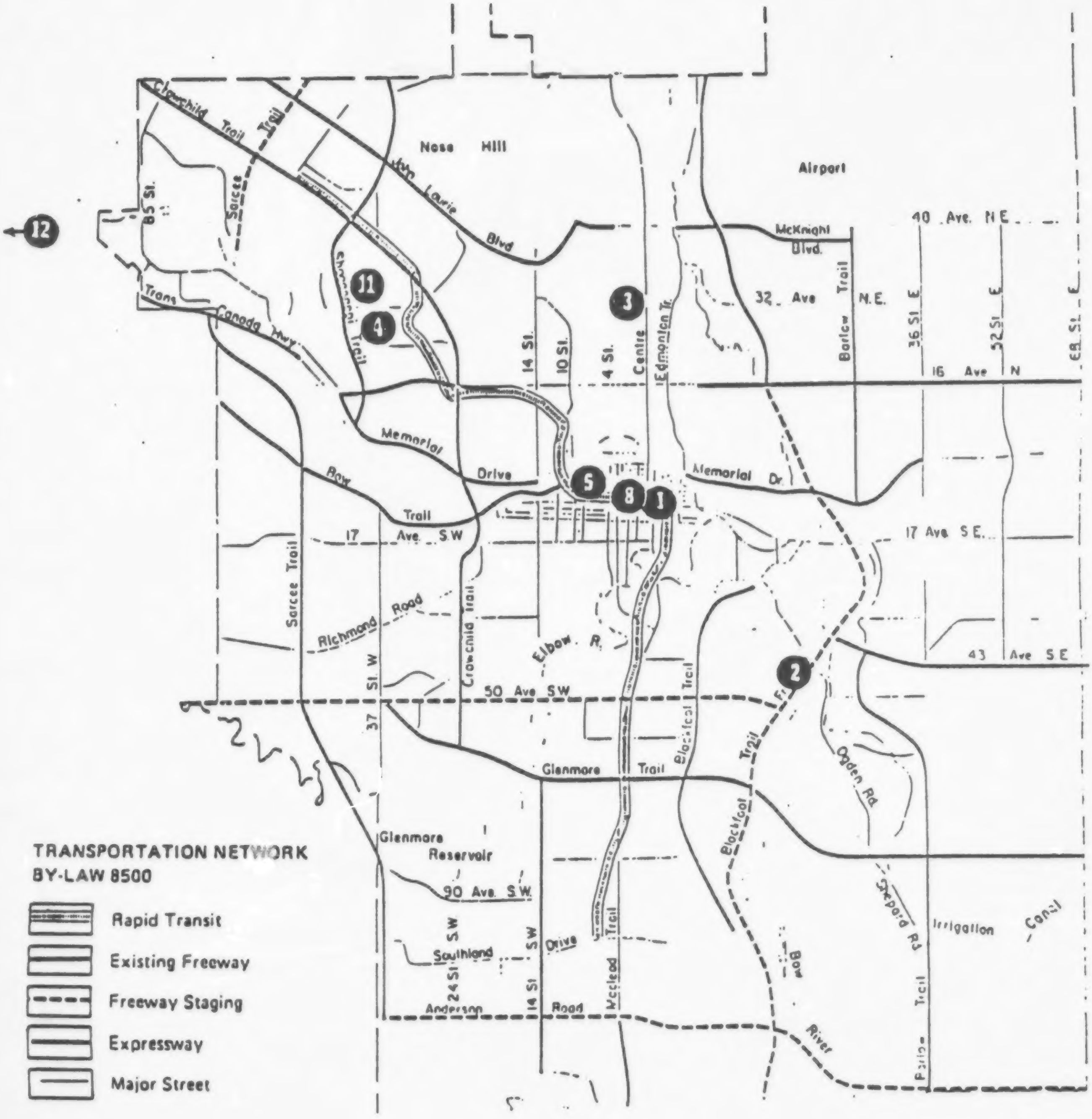
Crowchild Trail
Sarcee Trail
85 St.
Nose Hill
John Laurie Blvd
Airport
12
11
4
3
McKnight Blvd.
40 Ave. NE
32 Ave N.E.
Barlow Trail
36 St E
52 St E
68 St E
16 Ave N
Trans Canada Hwy
Crowchild Trail
14 St.
10 St.
4 St.
Centre
Edmonton Tr.
Memorial Drive
Bow Trail
5
8
1
Memorial Dr.
17 Ave. S.W
17 Ave S.E.
Sarcee Trail
Richmond Road
Crowchild Trail
Elbow R.
37 St. W
50 Ave S.W
43 Ave S.E
2
Blackfoot Trail
Glenmore Trail
Blackfoot Trail
Ogden Rd
Glenmore Reservoir
90 Ave. S.W.
24 St. S.W
14 St S.W
Southland Drive
Macleod Trail
Anderson Road
Bow River
Irrigation Canal
TRANSPORTATION NETWORK
BY-LAW 8500
Rapid Transit
Existing Freeway
Freeway Staging
Expressway
Major Street

FIGURE 6: SAMPLING SITES AND MAJOR CALGARY ROADWAYS

(6) a downtown location - at the third floor level of the J. J. Bowlen building

(7) a downtown location - at the thirteenth floor level of the J. J. Bowlen building, 620 - 7th Avenue S.W.

(8) a downtown location - at street level outside the parkade at 112 - 9th Avenue S.W. in the central core of the city.

(9) a downtown location - roof top of parkade, approximately the 4th floor level.

(10) a downtown location - interior of parkade next to ticket dispenser.

The sampling period for atmospheric samples was usually 24 hours from midnight to midnight; however, in the case of downtown street level locations sampling periods were shorter, about 8 hours from 8:00 a.m. to 4:00 p.m., and at the rural location sampling periods of up to 4 days were used. In order to measure the build-up of pollutants with increasing traffic flow and the rate of dispersion of these pollutants consecutive one hour samples were taken on occasion for fourteen hour periods. In the case of vehicle exhaust samples the collection period usually was one hour. As the larger displacement engines emitted a greater volume of exhaust than the capacity of the sampler, collection was not total.

The number of samples collected from each site were as follows:

1.	Roof of police station	58
2.	Ogden Meteorological tower	55
3.	North Calgary residential	59
4.	University of Calgary	44
5.	J. J. Bowlen, street level	70
6.	J. J. Bowlen, 3rd floor	69
7.	J. J. Bowlen, 13th floor	70
8.	Parkade, street level	8
9.	Parkade, roof	8
10.	Parkade, interior	24
11.	West Calgary residential	12
12.	Kananaskis rural	6
	Vehicle exhaust	9
	Total samples	464

Detailed sampling at street level, the third floor level and the thirteenth floor level of the J. J. Bowlen building (sites 5, 6, and 7) on an hourly basis over one nine hour and one fourteen hour period provided information on the rate of mixing and dispersion of PAH from the street level transportation source.

B. OBSERVATIONS

Small but significant amounts of carcinogenic hydrocarbons were detected in the atmosphere of the city of Calgary. The most abundant carcinogens were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and o-phenylenepyrene with lesser amounts of up to fifteen other tumor initiators and tumor promotors. Concentrations of carcinogens in ambient air ranged from 1.8 ug/1,000 m^3 at downtown street level to 0.24 ug/1,000 m^3 at suburban locations.

Fifty five peaks in the GC-MS analysis of a composite air sample from site 10 in downtown Calgary were recognized as being aromatic hydrocarbons with a tentative identification being made of forty two of these. Based upon the fifty five peaks the total aromatic hydrocarbon content of the combined sample was 5.66 ug/1,000 m^3 of air. As the sampling location was about 40 feet above street level the amount of PAH at the pedestrian level would be considerably higher, about 12-15 ug/1,000 m^3. Of the 5.658 ug/1,000 of PAH measured in the atmosphere at the 3rd floor level of the city center location, about 0.85 ug or 15% consisted of carcinogenic compounds.

The major source of polycyclic aromatic hydrocarbons (PAH) in Calgary is the automobile resulting in the highest concentrations of PAH occurring in areas of high traffic density, i.e. at street level in the city center. Meteorological factors, primarily wind speed and the depth of the mixing layer, influence the dispersion of atmospheric PAH. The average Calgary wind speed of over 10 mph is favourable for the mixing and dispersion of pollutants as indicated by measurements of the vertical distribution of PAH. Amounts at the third and thirteenth floor building level were three to five times less than at street level. Although on occasion light winds moved pollutants from the downtown area into the suburbs, street level concentrations were five to six times less in the north western suburban areas of the city than in the downtown area.

Locations in west Calgary showed the smallest amounts of polycyclic aromatics, an average of 80 ug/1,000 m^3 during the period September 1974 to February 1975, reflecting the direction of the prevailing winds from the north west, bringing in air from rural regions. Almost without exception the greatest amounts of polycyclic aromatics, average 277 ug/1,000 m^3, were found in the atmosphere on the eastern edge of the city center, i.e., down wind from the city center (average 122 ug/1,000 m^3 at the third floor level of the J. J. Bowlen building) again reflecting the general movement of pollutants away from the city center by prevailing winds from the north west.

The exposure of the downtown residents would vary greatly according to the type of building and its location. Unsealed downtown residences would have virtually street level amounts of PAH in the air. A resident of such a dwelling would be exposed to about 56 ug/yr of PAH of which 8.4 ug would be known carcinogens. In contrast the downtown resident in a modern sealed apartment building with its air intake above the fifth floor level would receive only the same exposure as the suburban resident and would inhale about 7 ug/year of PAH.

The pedestrian or downtown street level worker is exposed to about 12 ug/1,000 m^3 of PAH in the air he breathes. Based on an 8 hour exposure while performing light work during which the ventilation rate was 20/minute the downtown exterior worker would inhale about 29 ug of polycyclic aromatic hydrocarbons per year of which 4.3 ug would be known carcinogens.

C. CONCLUSIONS

In summary the greatest amounts of PAH in the ambient air of Calgary occur in the city core at street level. Concentrations of PAH in this area are 3 to 7 times greater than in the major suburban residential areas of the city. The major source of these PAH emissions is the internal combustion engine which is the backbone of Calgary transportation, resulting in the highest traffic density being in the downtown area. Occasional relatively high concentrations of atmospheric PAH may occur in the suburbs as a result of light winds moving pollutants away from the city center usually to the north along the Nose creek valley or north west along the Bow River valley.

On a moderately windy day (average wind velocity of 12 mph) amounts were 3.6 times greater at street level than at the third floor level, which in turn were 1.3 times greater than at the thirteenth floor level. On a very windy day (average wind velocity of 26 mph) the same trend was found. Amounts at street level were 3.3 times greater than at the third floor level which were slightly higher than those at the thirteenth floor level. Thus on both days tested the majority of the street level pollutants, derived from motor vehicle traffic, were dispersed by the wind in the first 25 feet of elevation. Amounts of pollutants at all elevations were lower on the more windy day, 37% lower at street level, 31% lower at the third floor level and 26% lower at the thirteenth floor level.

After consideration of the elevation of the downtown sampling locations above street level it appears that the downtown pedestrian is subjected to 6 times as much PAH and 7 times as many carcinogens as the suburban resident. These results are in keeping with those obtained from fluorescence studies of crude cyclohexane extracts of the fiber glass filters. It should be noted that the composite sample consisted of samples from randomly selected days. The DOE air pollution index for these days ranged from 6 to 15 in the case of the NW area samples and from 6 to 19 for the downtown samples; indicative in all cases of "clean air" situations. These results are also in keeping with the data of Smith (1974) who found the amount of carbon monoxide at street level to be about 3 times greater in the city core than in the suburbs. Such data indicate the major contribution made by the automobile of both polycyclic aromatic hydrocarbons and carbon monoxide to the atmosphere at street level.

The conclusions of this study of atmospheric carcinogens and other polycyclic aromatic hydrocarbons in the Calgary atmosphere are as follows:

(1) Calgary's atmosphere contains small but significant amounts of several carcinogenic hydrocarbons, the most abundant being; benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and o-phenylenepyrene with lesser amounts of up to 15 other tumor initiators or tumor promotors.

(2) Ambient downtown air at street level contains at least 55 polycyclic aromatic hydrocarbons totalling about 12 ug/1,000 m^3, 15% of which consists of known carcinogens.

(3) The source of both carcinogenic and other polycyclic aromatic hydrocarbons in the Calgary atmosphere is primarily the internal combustion engine of the automobile.

(4) Downtown street level concentrations are 5 to 7 times higher than those of suburban residential areas reflecting differences in traffic density.

(5) Under average wind conditions in Calgary of 10 mph there is rapid mixing and dispersion of PAH pollutants in the downtown area so that concentrations at the third floor building level are three to four times less than at the street level.

(6) Downtown exterior workers at street level inhale about 35 ug per year of the fifty five measured aromatic compounds whereas the intake of the suburban resident is about 7 ug per year. About 70% of this is retained in the lungs to be metabolized by the enzyme defense system of the body.

(7) Downtown workers and apartment dwellers in modern sealed buildings with air intake above the third floor level are exposed to similar amounts of PAH as the suburban resident but workers or residents of older buildings likely receive exposures similar to that of the external downtown worker.

(8) Calgary's atmosphere contains generally lower amounts of PAH than the atmosphere of other major cities, however, during inversion conditions when the mixing layer is small and winds are calm much higher amounts are anticipated.

(9) Occupational exposure of some workers to carcinogens may greatly exceed that of the general population's exposure.

The most significant findings obtained during this research study were the identification of over forty polycyclic aromatic hydrocarbons and the quantitative measurement of these compounds in two composite air samples, one representative of the city core and the other of a residential area.

The polycyclic organic compound which has been most intensively studied in the urban atmosphere throughout North America has been benzo(a)pyrene. From epidemiological considerations it has been postulated that 1 ug/1,000 m^3 of BaP results in a 5% increase in the urban death rate from lung cancer (National Academy of Sciences, 1972). Using this as a basis Calgary, by comparison with other cities, has a relatively low air pollution problem. The question then arises to the significant quantities such as o-phenylenepyrene and benzo(a)anthracene or of the compounds which were present in trace quantities but are highly carcinogenic. Comparative data on the composition of PAH in the atmosphere of other cities is not presently available, therefore we have no means of comparing the relative carcinogenicity of the Calgary atmospheric pollutants. It may be expected, however, that the composition would be roughly similar to that in other cities in which the major source of these pollutants is the automobile.

V. RELATIVE COMPARISONS

A. Other Cities*

As noted by Smith (Smith, 1975), it is very difficult to compare levels of carbon monoxide pollution in different cities. As suggested in the study, and in many others, including Wright _et al_. (1975), Godin _et al_. (1972), Ramsey (1966), U.S. Environmental Protection Agency (1972), Kahn _et al_.(1974) and others, CO levels vary a great deal by location within the cities, by month of the year, by height above street level, and by local physiography and meteorological conditions. Therefore, all these factors must be known for CO monitoring sites before direct comparison can be made. Even then, a person may find that the conditions at a particular monitoring site are not at all typical of the city as a whole. Therefore, the best indicators of population exposure to CO are the COHb levels of that population.

In comparing COHb levels measured in several cities, the researcher must also be very careful to note the smoking habits of the sample, the time of the year in which the sampling occurred, the location of work of the people being tested, their occupations, the time of day when the samples were taken, the size of the samples being compared, and in general, how representative the population sample is of the city population as a whole.

Keeping these factors in mind, one can then compare the COHb data for Calgary with that of the two major COHb studies done in North America, Stewart _et al_. (1974) and Kahn _et al_. (1974).

The most meaningful comparison of the data from this study with data collected by Stewart and co-workers (1974) is achieved if one compares downtown data from Calgary with only other downtown areas or areas where a concentration of automobiles exists. Doing this, one finds that _five cities in addition_ to Los Angeles, Denver, and Chicago and levels with averages higher than those of downtown Calgary; Detroit, Houston, San Francisco, New York and Washington, D.C. In addition, Salt Lake City and Anchorage had areas that equaled the average COHb levels of downtown Calgary. This type of comparison suggests that only 8 (44%) of the 18 cities or areas had lower levels of COHb than Calgary.

---

*This section is taken directly from Smith, 1975.

Yet, if Radford (1975) is correct in his criticism of Stewart's calibration techniques, then Stewart's data for COHb average 0.6% too high. This would suggest that this sample of Calgary's COHb levels for both downtown and the University of Calgary is very high in comparison to those of other cities. Only Los Angeles and Chicago would have locales with average COHb levels higher than downtown Calgary and none of the general city averages would equal the Calgary downtown average of 1.7% COHb. Furthermore, both the 8 hour average and end-work-day COHb values for even the University would exceed the general averages for 13 of the 18 cities and areas studied by Stewart and co-workers.

In summary, the above comparisons suggest that Calgary is not among the worst cities for CO pollution, such as Chicago, Denver, or Los Angeles. However, on occasion the COHb levels of the population in downtown Calgary probably do rise above the COHb levels measured in many other cities that do not have the conditions in Calgary that facilitate CO air pollution, frequent temperature inversions, cold climate, relatively high altitude, large number of automobiles, and vehicle concentrations in a downtown area congested with high rise buildings. Still, if Radford's (1975) criticism of Stewart's data is correct, then the CO pollution in Calgary is relatively more serious.

In their study of carcinogenic hydrocarbons Peak and Black noted that a comparison with scant information from other cities indicates that, on the average, exposures in Calgary are low primarily because of the lack of heavy industrial sources of emissions, however on calm days, when the mixing layer is shallow, concentrations of polycyclic aromatic hydrocarbons from the automobile source likely will reach that of industrialized cities. (Peak and Black, 1975, p. 10).

B. Air Pollution Vs. Smoking

Carcinogenic hydrocarbons, whether they be inhaled as air pollutants or as cigarette smoke, will increase the chances of the recipient contracting lung cancer. In the case of atmospheric pollutants this increase has been estimated to be 5% per 1 ug/1,100 m^3 for BaP in the atmosphere. For cigarettes the rate has been calculated at a doubling of the lung cancer death rate per pack of 20 cigarettes smoked per day. Thus it is apparent that unless some specific occupational source of carcinogens exists, cigarette smoking constitutes a far more serious hazard than air pollution (Peak and Black, 1975). Smokers in office buildings downtown averaged three times as much COHb in their blood as did nonsmokers. The expired air of the smoker, in not an a-typical situation, remained well above that of the room air and close to 3.4% COHb higher than the nonsmoker throughout the day. At the end of the day, 80% of the smokers had COHb levels greater than 5%, and 8% of the smokers in excess of 10% COHb. Thus, the smoker was actually adding to the CO load in the room air.

VI. IMPLICATIONS FOR PLANNING

From the various documents referred to throughout the previous discussion a number of general recommendations may be formulated relative to the implementation of design guidelines for buildings and areas subjected to unacceptable levels of air pollution. These recommendations are as follows:

1. Special attention be observed to seal the lower floors of new buildings to exclude traffic-generated CO;

2. Where possible, major entrances into buildings should be located such that prevailing road winds blow parallel to them, building sides which face major urban roadways should be as air-tight as possible;

3. Internal pollutant sources, such as parking garages within buildings, should be force ventilated outside the building;

4. That paving of back lanes in the downtown area be promoted as a means of reducing dust;

5. Criteria should be developed for undertaking wind impact studies for new buildings in the downtown. These would include criteria relating to the determination of new buildings requiring wind impact studies, the content of the study itself, and criteria for evaluating the study's results and implications.

6. Amendments be made to the existing Minimum Maintenance By-law to ensure that all buildings be properly and adequately sealed (eg. windows and doors) at all levels exposed to concentrations of pollutants in excess of provincial standards;

VII. CONCLUDING COMMENTS

Perhaps we find ourselves asking the same questions put forward by Tollefson in 1971:

1. How much pollution in the downtown environment are Calgarians willing to accept? With air pollution levels increasing and local conditions frequently exceeding Provincial air quality standards we find ourselves, perhaps paradoxically, attempting to increase the number of automobiles entering the downtown. At the same time, there have been substantial efforts to encourage the development of housing for the elderly in the downtown, a group which is among the most sensitive to air pollution. A crucial question then; what priorities should be assigned to those activities "creating" pollution and to those suffering because of it?

2. Should anything be done to prevent further pollution? Is the downtown's air pollution problem serious enough to give substance to policies aimed at discouraging automobile use within the downtown area or policies designed to channel new

commercial growth to locations outside of the city's centre? While present pollution levels appear tolerable to many downtown users it is clear that current levels *do* present a health hazard to many and, in the long run, perhaps to us all.

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January 21, 1991 Reference No. 519

Mr. Bob Mitchell
Coordinator, Clean Air Strategy for Alberta
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Dear Mr. Mitchell:

Enclosed is a submission by the City of Edmonton on the Clean Air Strategy for Alberta. City Council approved this submission at its regularly scheduled meeting on January 15, 1991. We are pleased that the Government of Alberta has taken the initiative to develop its strategy in cooperation with Alberta municipalities, who will be affected by the final policies adopted to protect air quality. The City of Edmonton is a major stakeholder in environmental protection and as a supplier of electrical energy to a large urban population.

The City's submission highlights basic principles and important consideration that should be included in the development of the strategy. The civic administration has been asked to report back to the Executive Committee of Council by April, 1991 on more specific plans for the City of Edmonton itself.

We understand that there will be further consultation as legislation is drafted, including a Spring 1991 workshop. City representatives appreciate the opportunity to participate in the workshops and are prepared to cooperate in the development of a cost-effective strategy.

Yours truly,

J Reimer

Jan Reimer
Mayor

JR/sbg
Enclosure
cc: Councillor Gary Browning, President, AUMA
Mr. Norm MacMurchy, A/Deputy Minister, Alberta Department of Energy
Mr. Ken Smith, A/Deputy Minister, Alberta Department of Environment

SUBMISSION OF THE CITY OF EDMONTON ON THE CLEAN AIR STRATEGY FOR ALBERTA (CASA)

January 16, 1991

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1.0 INTRODUCTION

The City of Edmonton endorses the Government of Alberta's initiative in developing and implementing the Clean Air Strategy for Alberta (CASA). CASA is an important initiative considering Edmontonians' and Albertans' commitment to protecting the environment, while developing a major sector of the economy. The three objectives of CASA are fully supported by the City of Edmonton:

- to help identify and clarify the most important issues associated with energy production and use, that need to be addressed in developing a Clean Air Strategy;
- to outline practical and achievable actions that can be taken by consumers and producers to reduce emissions;
- to develop policy and program recommendations to present to the provincial government.

The City of Edmonton's approach in replying to both the request from the Province and the Alberta Urban Municipalities Association for the City of Edmonton to participate in CASA was to develop adequate background information as a first step towards an air quality plan which affects a municipality as a stakeholder in the environmental process and as a major supplier of electrical energy to a large urban population.

A review and discussion of the air quality issue by the City Emissions Sub-Committee of the Interdepartmental Task Force was carried out by officials representative of key stakeholder departments from Edmonton Power, Office of the City Solicitor, Public Works, Transportation (Edmonton Transit and Transportation Planning), Planning and Development, Finance and Parks and Recreation. Subsequently a study towards an air quality plan for the City of Edmonton was authorized by the City of Edmonton for the Alberta Research Council to review air quality plans with particular reference to cities. The Alberta Research Council identified the key elements and analyzed data of such plans and made recommendations towards the development of an air quality management plan for the City of Edmonton and assisted the City in the development of a coordinated response to the Province's initiative of a Clean Air Strategy for Alberta. In the discussion, materials from the City of Edmonton's response to the Green Plan and the Clean Air Strategy for Alberta Workshop One were also used.

Air quality plans have been reviewed and information summarized for consideration by the CASA task group. The plans reviewed were for the cities of Sacramento, Toronto, Winnipeg, Vancouver and Oslo and the regions of the Greater Vancouver Regional District (GVRD) and the South Coast Air Quality Management District (SCAQMD) and the Federal study on deadly releases of CFC's. From the review, one can identify the following elements as essential to the development of an air quality plan for a city: targets and goals; education and communication; an inventory of the emissions; some form of cost-benefit analysis; initiation within the city government; and Provincial/Federal cost sharing.

The air quality plans for the City of Toronto and the City of Vancouver both show an official commitment to the 20% reduction of the 1988 levels of carbon emissions into the atmosphere within their cities by the year 2005. While the City of Edmonton agrees in principle to the intent of this recommendation, there are a number of difficulties. First, the City of Edmonton does not have the provincial enabling legislation to address atmospheric environmental issues directly. Secondly, since the global warming problem is of worldwide scope, it is not meaningful for a municipality to set CO_2 emission targets within its own boundaries. This could in fact be counter-productive as shown in a subsequent section of this report. For example, Edmonton Power's gas-fired power stations in the City, which are more environmentally friendly, are currently used only after all available coal-fired plants are fully utilized because coal is far cheaper fuel than natural gas. This was discussed with Environment Canada but changes in operational sequence of the plants was not recommended because of the high extra fuel cost. Thirdly, there is a question whether the reduction is really achievable without major economic considerations and impact on development and the standard of living.

The implementation of environmental measures and strategies at the municipal level are to be coordinated with both the Federal and Provincial Government, and probably with other municipalities. This includes the development of targets, schedules, and resources. Cost and information sharing are two important areas which facilitates both development and implementation. It is important to examine ways by which information and experiences can be exchanged and funding and resources (including expertise, equipments and facilities) can be shared. It is important to investigate ways by which environmental measures can be effectively implemented through the sharing of costs, information and other resources with the Federal, Provincial and other municipal governments. The City of Edmonton recommends that, because of the national and international scope of the air quality issues, the Provincial and Federal governments should provide adequate funding to address the required environmental measures such as funding required for the phase-out of CFC's.

2.0 PRINCIPLES AND MAJOR CONSIDERATIONS

The City of Edmonton supports the following principles in the development of their recommendations:

- Solutions should work with nature, and not create other environmental problems.
- Strategy measures should be priorized on the basis of their environmental and economic effectiveness.
- Strategies should be cost-effective, and wherever possible should address several problems at once.
- Research and development of new technologies and processes should be encouraged through government and corporate purchasing policies.
- A broad range of policy instruments including market based approaches should be considered.
- Government should allow the maximum flexibility to encourage innovation in meeting goals.
- An ongoing process of discussion and education must be developed so that the public and their decision-makers know how their activities and programs affect atmospheric change.
- The public must be involved in both developing and implementing solutions.

- Since the global warming problem is of worldwide scope, it is not meaningful for a municipality to set CO_2 emission targets within its own boundaries. There is a question whether the reduction is really achievable without major economic considerations and impact on development and the standard of living.

- In anticipation of federal guidelines for the phase-out of CFC's and other ozone-depleting substances, it is desirable to examine the possible phase-out measures and obtain estimates of the costs and impacts at the municipal level with preliminary plans of implementation.

- It is important to investigate ways by which environmental measures can be effectively implemented through the sharing of costs, information and other resources with the Federal, Provincial and other municipal governments. Because of the national scope of the air quality issues, the Provincial and Federal governments should provide the leading role in the supply of adequate funding to address the required environmental measures such as funding required for the phase-out of CFC's.

- Prevention of future problems should focus on the control of new sources since the retro-fit of existing sources or previously approved plants under construction is normally much less economically effective and could involve serious penalties.

- Continued input by the stakeholders into policies or regulations for emission reductions should be required.

- Federal and provincial policy should be harmonized.

In June 1990, these principles were applied when the City of Edmonton presented a corporate response to the Green Plan. The response "expresses strong support for the Government of Canada's initiative in developing this discussion paper, and the for concept of sustainable development as described therein". The response included a number of points that are equally applicable to the CASA. The response also lists comments and concerns on the part of the City in relation to the Green Plan. The relevant points can be summarized as follows:

(a) The City proposes that the national environmental strategy provide specific recognition of municipal governments and include them as partners in planning as well as implementing strategies.

(b) There is a need for jurisdictional clarity on environmental matters to facilitate both compliance and enforcement.

(c) The City recommends that the federal strategy ensures that some of the new environmental business be located in areas suffering most economically from other new environmental regulations.

(d) There are comments on how the City can participate in the decision making initiatives, which include the emphasis on better and more scientific research, more information on the environment, increased environmental education and the development of legislation and regulation.

(e) It is important that municipalities' roles in providing the first line of response to many environmental emergencies be recognized and incorporated into the proposed national strategy.

(f) Edmonton Power, a major stakeholder for the City of Edmonton, has concurred with the public position of the Canadian Electrical Association with respect to global warming. It was noted that any radical change in power generation methods in Alberta would undermine the existing electrical generation system in the province. The

City's response also supports the development of new technologies to minimize emissions and promote district energy. Emission targets should also be established for all greenhouse gases at the national level to promote interaction among all sectors and minimize specific regional or sectoral impacts.

3.0 GENERAL ISSUES IDENTIFIED IN THE CLEAN AIR STRATEGY FOR ALBERTANS AND EDMONTONIANS

The CASA workshop held in Edmonton, September 6 to 8, 1990 identified various issues and options affecting air quality. The following discussion based on the workshop results (CASA, 1990), initiatives taken by the City of Edmonton and research carried out for the City by the Alberta Research Council examines the key points related to the general issues of air quality for Albertans and the options available.

3.1 Regarding what is clean air and how do we know when we achieve it?

3.1.1 Air Quality Standards and Targets

These are needed as well-defined goals for clean air quality. It was accepted that standards and targets should be derived from scientifically sound assessments of the impacts of gaseous emissions. While ambient standards for many air contaminants already exist, others could be required.

The CASA workshop results suggested that the existing standards and guidelines be re-evaluated and revised if needed. The Montreal Protocol, for example, was updated in the London Conference of 1990 with a tighter and more encompassing set of constraints on CFC's, Halons and other ozone-depleting substances. Re-examination of existing standards may also be necessary with technological development. These should be considered in the efforts towards an air quality plan.

It is also useful to approach certain air quality management problems from the airshed standpoint. This means that the factors affecting air quality from the surrounding areas should also be taken into account. In such cases, "target loadings" or "emission caps" for the complete airshed should be considered if appropriate.

It is important to monitor ambient air quality and major emission sources. This allows the enforcement of the standards to ensure that established goals are met. It was also suggested in the CASA workshop result that goals and standards should be responsive to new scientific information, technological advances and to changing public perceptions and attitudes.

3.1.2 Assessment of City of Toronto's The Changing Atmosphere: A Call to Action and the Initiatives Taken by the City of Edmonton

The following describes relevant initiatives taken by the City of Edmonton based on the City of Toronto models that have been examined by the City of Edmonton for addressing air quality problems. These are presented here as updated information for CASA and represent contribution from the Interdepartmental Environmental Task Force with major stakeholders' feedbacks. These are hopefully useful to CASA in coordinating and developing efforts to improve air quality. The City of Edmonton would be pleased to discuss any of these initiatives in the next workshop on air quality. The City of Edmonton has undertaken many air quality programs which are the same or similar to those recommended by the City of Toronto Special Advisory Committee on the Environment and approved by the City Council of Toronto. In other cases, the recommendations address concerns which are specific to Toronto and are not generally applicable to Edmonton. In still other instances the recommendations may be worth pursuing in Edmonton and have been referred to the appropriate agency or department for further review.

Several initiatives were of an administration nature, such as, the gratitude expressed to the Special Advisory Committee on the Environment and have not been included in the City of Edmonton's response.

Responses to each recommendation of the Toronto committee are presented below.

(a) That City Council declared an official commitment to the 20% reduction of the 1988 levels of carbon emissions into the atmosphere within the City of Toronto by the year 2005.

While we agree in principle to the intent of this recommendation, there are a number of difficulties. First, the City of Edmonton does not have the provincial enabling legislation to address atmospheric environmental issues directly.

Secondly, since the global warming problem is of worldwide scope, it is not meaningful for a municipality to set CO_2 emission targets within its own boundaries. This could in fact be counter-productive. For example, Edmonton Power's gas-fired power stations in the City are currently used only after all available coal-fired plants are fully utilized because coal is far cheaper fuel than natural gas. One way to reduce CO_2 emissions in Alberta would be to change this and operate Edmonton Power's gas-fired plants at as high a capacity as possible. This would displace some of the much higher emitting coal-fired plants. Even though this would increase CO_2 emissions within the City, it would reduce emissions globally. This was discussed with Environment

Canada but not recommended because of the high extra cost. Thirdly, there is a question whether the reduction is really achievable without major economic considerations and impact on development and the standard of living.

(b) That City Council, adopt in principle, the recommendations contained in the report prepared by the City of Toronto's Special Advisory Committee on the Environment, dated October 30, 1989, entitled "The Changing Atmosphere: A Call to Action".

Detailed comments regarding specific recommendations are contained in this assessment. Toronto's recommendations recognize the municipality's limitations in reducing air pollution. However, the recommendations should have included a call for greater leadership and financial support from both the Provincial and Federal governments for:

- larger public transit vehicle fleets
- rapid transit systems and alternative transportation
- alternative fuel and cleaner-burning vehicles.

(c) That an Interdepartmental Coordinating Committee on the Environment be formed to coordinate Corporate response to environmental issues in the City. This Committee to respond to all issues relating to the City and the environment and report through the Committee of Heads.

The new Interdepartmental Environmental Task Force and Office for the Environment in Public Works were both established in 1990 and will provide such coordination as is necessary on matters beyond existing department responsibilities. The City of Edmonton plans to coordinate its environmental responses with other urban centres in Alberta, especially the City of Calgary. However, it is also important to realize that Edmonton Power, although a department of the City, is also a utility having a high degree of environmental expertise, and it is important that Edmonton Power continue to have the necessary autonomy to compete effectively in the electric utility business.

(d) That a representative of Toronto Hydro serve on the Interdepartmental Coordinating Committee on the Environment and further that Toronto Hydro's offer of resources be seriously considered by the Interdepartmental Coordinating Committee and reported back to the Executive Committee.

Edmonton Power is currently represented on the Interdepartmental Environmental Task Force. The Task Force is considering inviting representatives from Alberta Environment and Alberta Energy to attend Task Force meetings from time to time to discuss issues having Provincial involvement as they arise.

(e) That the Interdepartmental Coordinating Committee on the Environment prepare bi-annual status reports and include a tabulation of all initiatives and the progress of each and include various graphs to provide City Council with an indication of the progress in reaching a 20% reduction of 1988 levels of carbon dioxide emissions by 2005.

Monitoring the effectiveness of environmental initiatives within the City would provide useful information, but not in relation to meaningless targets such as the 20% reduction. There is every indication that the public and politicians would welcome more information on our progress and the state of the environment. The need to educate has been identified in submissions to both the Clean Air Strategy for Alberta and the City's Task Force sub-committees.

(f) That the Commissioner of Planning and Development examine possible appropriate strategies for the City of Toronto to prevent and control urban sprawl in the Metropolitan Toronto area.

The Planning and Development Department endorses this strategy, but the City of Edmonton is a growth-oriented city and the planning policies of the City departments reflect this. The City encourages growth throughout Edmonton but attempts to limit urban sprawl by several objectives and policies outlined in the draft General Municipal Plan. These are:

- To renew the physical and socio-economic environments, housing, infrastructure and community image in selected inner city residential neighbourhoods.
- To maintain, renew, or revitalize, as appropriate, the inner city communities.
- To encourage new development to be continuous with existing development.
- To ensure the orderly and efficient extension of municipal services and discourage the inappropriate use of temporary services.
- To encourage development proposals which lead toward the completion of neighbourhoods and meet the service and amenity needs of residents within a reasonable timeframe.

- To promote the development of town centres in suburbs.
- To strengthen and enrich the Downtown and maintain its importance as Edmonton's Centre.

- To develop housing in and near Downtown as an essential element in achieving a diverse Downtown.
- To preserve agricultural land management areas for agricultural use.

These objectives are implemented through specific projects such as A.M.P.L.E. and PRIDE, and through the day-to-day activities in reviewing suburban Area Structure Plans.

The inclusion of environmental issues in land use planning in Edmonton will require the form of urban development in Edmonton to change. It will also require considerations on density and development to change. Review at the moment focuses primarily on ensuring an adequate roadway access and pedestrian circulation systems for access to transit, schools, parks and neighbourhood amenities. The Interdepartmental Environmental Task Force is considering whether specific land uses and their relationship to transportation corridors and activity areas can be assessed in terms of their effect or contribution to the environment or global warming.

The computer modelling used in planning by the Transportation Department features methods of calculating air quality and emissions. Although it would be difficult to use air quality and emissions directly in performing a benefit/cost analysis, they are related to delays, the primary factor affecting this analysis.

(g) That City Council endorse the establishment of an Energy Efficiency Office, and that the establishment of an Energy Efficiency Office, with an advisory board composed of outside agencies such an Energy Probe, etc., be considered by the Interdepartmental Committee on the Environment and its consideration of energy conservation.

The City should investigate means within its control to improve energy efficiency and conservation. Any measures should also be economically efficient and address possible social and business investment consequences. Energy Management Committee staff members could coordinate City Departments work efforts through the Interdepartmental Environmental Task Force.

The City of Edmonton established an Energy Management Policy and a position to coordinate energy management in the City in 1981. Civic departments have made great strides in reducing energy consumption in civic facilities, as can be seen from the effective energy conservation activities described in the Annual Reports from the Energy Management Committee.

(h) That the Medical Officer of Health and the Commissioner of Public Works report jointly on the proposed "remote tail-pipe sensing demonstration project".

The Interdepartmental Environmental Task Force is examining this issue. There are a number of other operational issues where the City of Edmonton has taken action. As a leadership and public good gesture, the City could seek compliance for all City-owned and operated vehicles. The difficulty in establishing standards is the perceived emissions; for example, a diesel bus appears to be "dirty", however, when viewed in terms of relative environmental impacts, one bus is equivalent to 40 cars, Edmonton Transit is keeping abreast of developments in the use of alternative fuels and technology with the possibility of introducing pilot initiatives.

Mobile Equipment Services (MES) of the Public Works Department has been investigating alternative fuels on an ongoing basis. Compressed natural gas (CNG) as an alternate transportation fuel has been studied by MES as early as the mid-1970's and throughout the 1980's. CNG represents an alternative to gasoline, both in fuel savings and reduction in emissions. However, there are certain drawbacks with CNG that have to be seriously considered, such as: on-board fuel storage and capacity; space occupied by fuel cylinders; and limited availability of refuelling facilities.

There are other alternatives to gasoline and diesel; examples are propane and methanol. MES has chosen propane or LPG as its alternative to gasoline. Liquid Petroleum Gas (LPG) shares many of CNG's positive attributes relative to health and safety considerations. It has a matured storage and distribution network system within the City and costs significantly less for conversions.

(i) That a complete study of the City's use of small vehicles (some 1,200 in number) be initiated with the following objectives in mind.

(j) A reduction in the number of such vehicles used by the City.

(k) A dramatic increase in the maintenance programmes on these vehicles.

(1) A programme which would replace high energy consumptive vehicles with low-energy consumptive vehicles.

Responses to recommendations (k) to (1) are as follows:

The City's fleet has been reduced from about 3,400 to about 2,800 units over the past eight years. All vehicle purchases are engineered and specified for tender so that the smallest or most economic (i.e. energy efficient) unit is placed in service. However, it should be noted that many City cars were eliminated from service and replaced by employees' use of their own vehicles.

Vehicle maintenance scheduling and maintenance activities are based on an economic cost model which minimizes the City's costs of ownership and operations over the life of the vehicle. Notwithstanding, all vehicles are tuned at regular intervals, during which time emissions are tested to ensure the original emission standards in effect at the date of manufacturing are met.

In addition, the civic accommodation strategy will consolidate civic offices in the downtown core around Churchill Square. This will minimize the amount of travel required by civic staff in the performance of their duties. The existence of an extensive pedway system further encourages City employees to walk to nearby destinations, rather than use a vehicle. Where sufficient demand for civic services exists, decentralized City offices for such services as Community and Family Services offices have been located on public transit routes throughout the City to minimize the travel required of the public to access City services. It should be noted that minimizing travel to the public may increase travel for City staff, and vice versa. The decision rule used to site civic services considers both cost and service to the public.

The City is reviewing other initiatives including:

- reducing the total City fleet by a percentage per year to be established over the next five years.
- converting all City fleet vehicles for use of alternative fuels by 1995.
- adopting the recommendations included in the Alberta Research Council's Report Towards An Air Quality Plan for the City of Edmonton.

(m) An automobile-trip reductions strategy which would reduce the need for the use of such vehicles.

There is a need to educate City staff on the merits of prudent use, i.e. reductions in emissions and associated cost-savings. Options for employee travel include provision of employee transit passes, and a reduction in parking and fleet. This would require the City to examine current policies and budgets to develop a feasible and fully operational automobile-trip reductions strategy, being both environmentally aware and meeting the needs of the public.

(n) The provision of the City bicycles rather than City cars for short trips.

The Transportation Department is examining the use of the inter-office messenger service downtown by bicycle, including the use of 3-wheel bicycles (trikes) with storage baskets to hold small loads which would eliminate the use of the auto for short trips. Adequate bicycle storage facilities would be required. Severe weather may also impact the ability for full implementation of this option.

(o) That all companies in the downtown area be contacted and called upon to take steps to reduce the use of the automobile for commuting to work by their staff including senior executives and in addition that a survey be prepared for distribution within these companies which would request employees, including senior executives, to indicate the reasons why they use their cars and what would be required for them to switch from car use to either public transit, or bicycles.

The City of Edmonton has already undertaken two major projects toward realizing the objective of this recommendation: (1) the transit users study; and (2) the employee attitude survey. Information gathered from these studies has resulted in marketing programs being developed. These are now ready for implementation. Particular attention has been paid to cost effectiveness and environmental concerns.

The Interdepartmental Environmental Task Force is examining the use of free employee parking and free transit passes for employees.

The Task Force is also examining other steps which could be taken include encouraging high occupancy vehicles, staggered hours, parking reductions, increase in price for long-term parking, and reduction in parking standards.

(p) That a comprehensive energy audit programme be instituted and accelerated.

The City of Edmonton established an Energy Management Policy and a position to coordinate energy management in all City departments in 1981. Since that time, 84 separate energy audits have been performed on City facilities in conjunction with the Energy Conservation Branch of Alberta Energy and Natural Resources. The City fully supports this Energy Audit Program and recommendations from audits will continue to be implemented. An example of current energy management conservation practices is the Environmental Services Department's testing of fine versus course bubble aeration technology at Gold Bar Wastewater Treatment Plant, which could result in reduction of power usage of up to 35%. Civic departments have made continuous progress in reducing energy consumption in civic facilities, as can be seen from the effective energy conservation activities described in the Annual Reports from the Energy Management Committee.

The City is also investigating means within its control to improve energy efficiency and conservation. The City of Edmonton is investigating means to have all groups including commercial, industrial, and institutions, which are outside the City's direct control, participate in energy audits offered by the Energy Conservation Branch of Alberta Energy and Natural Resources. Enabling legislation for required energy audits is not in place. To date the main thrust of the City has focused on public education, mainly through the Energy Awareness Week. Participants in 1990 included Public Works, Power, Parks and Recreation and the Environmental Services Departments of the City with others being Alberta Energy, Chamber of Commerce, Northwestern Utilities, Public and Private Schools, the Environmental Resource Centre, Private sector financial participation was also received from Esso and the Canadian Petroleum Association. The success of Energy Awareness Week in November, 1990 prompted the Honourable Rick Orman, Minister of Energy and Natural Resources, to consider expanding the program to province-wide participation for 1991.

(q) That the City of Toronto Special Advisory Committee on the Environment be requested to develop more details on its proposal for the City of Toronto to contribute to reforestation projects in order to outline in more detail the options that would be available to the City and indicating to the Special Advisory Committee on the Environment that City Council is looking favourably at this concept and that the Special Advisory Committee on the Environment be urged to consult with Boards of Education regarding possible participation in the reforestation projects.

This could be a good public awareness program. However, it is suggested the project be confined to within the City limits; the public may not be supportive of municipal funds spent in other countries. The City could take the initiative by ensuring all City-owned property is adequately landscaped.

(r) That the Commissioner of Parks and Recreation, in consultation with the Special Advisory Committee on the Environment develop the parameters for a major shade tree planting programme which would have the effect of reducing the adverse effect of local warming and reduce the need for air-conditioning.

The City of Edmonton, through Parks and Recreation's Current and Capital Program, annually provides for the planting of 4,000 - 6,000 trees and 5,000 - 7,000 shrubs. The primary purposes of these plantings are aesthetic and screening. Such plantings help reduce micro-climatic extremes, and assist in air quality improvement. Park/boulevard trees are 15 times more effective in removing carbon dioxide from the atmosphere than their forest counterparts. The Corporate Tree Policy provides for the protection and preservation of trees on City land. Trees lost through municipal or private activities or damages are compensated for and funds received used for further tree plantings. Community involvement in tree preservation and reforestation are encouraged through programs such as "Partners in Parks" and voluntary planting programs.

(s) ***That the Toronto Parking Authority and the Commissioner of Public Works report to the City Services Committee on its parking rates as they relate to the parking rates of the private sector and include a consideration of the recommendations from the Special Committee that parking rates be increased to meet those of the private sector and on the concept of utilizing the proceeds from parking revenue for the purposes of reducing the environmental consequences of automobile traffic.***

The rates charged by the City at its lots are among the highest charged by any lots in the downtown area. In contrast, the City of Toronto charges are among the lowest in that city.

The City is considering a change in philosophy that would discourage long-term commuter parking, yet still meet the short-term parking needs of downtown businesses. This change in philosophy if implemented would require the restructuring of parking fees to remove the discounting associated with longer-term parking, and offer favourable pricing for short-term turnaround.

(t) ***That the City Cycling Committee be encouraged to bring forward ambitious recommendations for the provision of bicycle lanes and the promotion of cycling generally including winter cycling in the City of Toronto. This report should also include the description of a programme to increase bicycle parking facilities to the required levels.***

A bicycle commuter's survey has been completed and is being analyzed by the Transportation Department as part of a comprehensive review of cycling in Edmonton. The Transportation Department is a member of the Cycling Education Committee which is comprised of cycling advocates and groups.

Edmonton Transit is currently undertaking a programme of installing bicycle parking facilities at LRT Stations and major transit centres (racks are currently installed at Clareview, Belvedere, Stadium, Westmount, Meadowlark and Millgate. Edmonton Transit will be presenting an amendment to the Transit Bylaw which will permit bicycles on board LRT cars during off-peak periods. Review is also underway for options to possible accommodation of bicycles on buses.

(u) That the City of Toronto consider re-running the retrofitting program known as "Operation Draftstop" and that the City, in cooperation with Toronto Hydro, consider initiating a home retrofitting program for energy efficiency in terms of home appliances and light fixtures.

Edmonton Power is currently preparing a new demand side management program to increase electricity conservation and reduce the power demand peak within the City. The program must take into account the actions of other Alberta utilities (since all electricity in the province is pooled) and the Public Utility Board rules. The draft program may also require the approval of Alberta Energy in the future according to proposed government measures.

(v) That a Toronto Atmospheric Fund be established and the Interdepartmental Committee on the Environment consider a suggestion that an initial deposit of $23,000,000 or 20% be made from the proceeds of the sale of the Langstaff and Concord Farms.

The Interdepartmental Environmental Task Force is considering a recommendation to request the Province to establish an Environmental Fund, funded by a fee to be charged on motor vehicle registration renewals and to be transferred to municipalities for environmental programs and research.

(w) That the Provincial Government be requested to introduce legislation to develop a 10% Carbon Release Surcharge (CRS) for all fuels and electricity used in the Province.

(x) That the Federal Government be requested to introduce Federal legislation to develop CRS nationally.

(y) That CRS funding be used to develop and use non-polluting energy alternatives.

(z) That CRS funding be used to finance changes to develop efficiency in the use of fossil fuels.

Responses to recommendations (w) to (z) are as follows:

A carbon tax is one of a number of financial measures under consideration by the Federal Government. Such a tax would be both non-equitable and very damaging to both the Alberta and Edmonton economies. The City of Edmonton specifically opposed this tax in the June, 1990 Green Plan Brief to the Federal Minister of the Environment. The Federal Green Plan tabled in the House, December 11, 1990, did not contain the carbon tax.

In any situation where taxes are collected, there is always the question of the assignment of "surcharge" revenues. These funds should not be returned to general revenue but be used for the development and implementation of more efficient technology.

3.1.3 The Federal Study on Deadly Releases CFC's

The Government of Canada Standing Committee on Environment tabled a report in the House of Commons on June 12, 1990 entitled "Deadly Releases CFC's". The Committee Members reached one overpowering conclusion -- not just a consensus, but a unanimous opinion -- that ozone depletion is a threat to the continuation of life on earth and that an accelerated phaseout in the production and use of chlorofluorocarbons and related ozone-depleting substances beyond that prescribed in the Montreal Protocol of 1987 is necessary to deal with this global concern. They summarized that if all CFC's in refrigeration systems throughout the world were released, the ozone layer would probably be destroyed causing devastating impact on Earth's life forms.

The Committee addressed options for controlling the man-made chemicals that are both depleting the Earth's protective ozone layer and contributing to global warming. They concluded that a major public policy is required to phaseout the use of chlorofluorocarbons, halons, and related chlorinated solvents worldwide, and ensure that they are replaced by the least harmful substitutes possible. Another policy also deemed essential was to ensure that all of these substances in use are recovered, recycled, and ultimately destroyed.

It was recognized that these policies cannot be completely implemented immediately but stressed that time is of essence. They have made a plea to governments, industries, labour movements, universities, and scientific organizations around the world to initiate action at once which will fulfil these policies while time is still available to protect human survival.

There were 23 recommendations tabled by the Committee dealing with various aspects related to chlorofluorocarbons such as control measures, recovery, recycling and destruction, market signals, research needs, internal measures, and public education and responsibility. The most significant of the recommendations were made in relation to control measures and the accelerated phaseout of the ozone-depleting substances. Specifically, recommendations were made for the Canada Environmental Protection Act (CEPA) to regulate:

(a) A minimum 85 percent reduction in the production and consumption of all CFC's by 1995, with a complete phaseout by 1997; and

(b) A complete phaseout in the production and consumption of carbon tetrachloride and methyl chloroform by 1995, except for their use as feedstock for CFC or halon substitutes and as organic laboratory solvents.

It was also recommended that regulations be invoked under CEPA requiring a 95 percent reduction in halon production and consumption by 1993, and a complete elimination by the year 2000, except for those "essential uses" where no reasonably performing substitute is available.

The City of Edmonton has drafted, but not yet passed, a bylaw dealing with the proper disposal and recovery of CFC's as well as their emission through the use of certain products. The City strongly urged in the November, 1990 submission on the proposed Alberta Environmental Protection Legislation that the Province include CFC's and halons as "designated material". This would have the effect of including CFC's and halons in the group of products potentially regulated by the Lieutenant Governor in Council and would place these materials under the Province's jurisdiction. This would ensure uniformity in their emission, disposal, and recovery throughout the Province and, the City submits, would be more effective than a municipality by municipality solution.

The district energy project, currently under detailed review by Edmonton Power, would result in the shutdown of building air conditioning refrigeration systems. The use of CFC's in these systems would thus be discontinued.

3.1.4 Research Needs

There is need to provide research support to air quality issues, particularly in the areas of the inventories of background pollutants and the development and verification of air quality and climate models. Also, there is a requirement for support in improved/enhanced transportation technology and use of alternate fuels. Other areas of importance are impacts of global warming and deforestation, the socio-economic impacts of air quality goals and the chronic health effects of low-level exposures.

With the anticipated commissioning of many Alberta mega energy projects which are major sources of air quality problems in Alberta, advances in technology associated with all phases of the production, transportation and consumption of energy are critical to the effectiveness in addressing the key environmental issues of air quality. The insecurity of the offshore energy supplies for both eastern Canada and United States places greater importance on the development of energy resources in Alberta. This means that research and development of various technologies are essential to reduce the uncertainties associated with the balance between environment and economy.

Also associated with research in air quality is the monitoring of air pollutants. In a recent report on regional air monitoring, the recommendation from the Public Advisory Board of the Acid Deposition Research Program (ADRP) is supported by the City of Edmonton for the Province to re-establish an air monitoring station at Fortress Mountain west of Calgary. Apparently, the Fortress Mountain station was able to detect high levels of ozone which were attributed to an influx from British Columbia and Washington. This was the first observation of the long range transport of ozone in western Canada. Monitoring is also useful in providing baseline information in various areas of the province. For example, there is concern amongst northerners that their environment is endangered by acid pollution imported from the Pacific coast. No background information is available to address their problem as there is no monitoring network established in their area to date. The City of Edmonton requests the Province to provide monitoring stations.

The City strongly supports the Province's recommendation of having a public facility such as the Alberta Environment library gather environmental information. The City submits that access to this environmental information should be readily available to all Albertans, free of charge or at a nominal rate. Discussions have been held among senior scientists from AOSTRA, Alberta Energy and the City of

Edmonton for the development of a common environmental data base.

Because of the scope of Air Quality issues, the City of Edmonton requests financial support in developing an urban air quality plan as described in the Alberta Research Council Report (December, 1990).

3.1.5 Public Acceptance

It has been observed that there is little public interest in the CASA consultation sessions so far. There is also a lack of public understanding of general issues like global warming. A recently reported opinion poll result states that 30 percent of Canadians think that global warming would be good for Canada. Such factors will certainly influence the level of public support in any environmental efforts.

Efforts should therefore be made to inform and educate the public regarding environmental issues and also the latest in scientific and regulatory developments. The public should have ready access to monitoring and compliance information and a multi-party consultation approach is needed in establishing targets and standards.

3.2 Regarding the way Albertans/Edmontonians include economic, environmental, and health considerations in decisions regarding clean air

3.2.1 Full Cost Accounting and Sustainable Solutions

It is desirable to perform detailed cost and benefit analysis of each option and to use the results in making decisions about energy and air quality. Full cost accounting means the consideration of all possible costs and benefits, including those related to the less tangible factors such as the quality of life. The cost-benefit ratio can be used in developing a set of sustainable solutions (i.e. solutions that provide economic health without further environmental degradation). The Oslo study is an example of a city air quality plan based entirely on cost benefit analysis. A subset of 20 measures were identified to maximize the benefits of their air quality management plan. (See the section on review of city air quality plans.)

3.2.2 Corporate Responsibilities

There is a need to incorporate environmental considerations into corporate decision-making through environmental policy statements and environmental and energy audits. The concerns of business for returns from investments and their focus on short term cash flows are possible impediments to environmentally responsible choices. However, these can be overcome by government incentive and awareness programs. Possible options will be reviewed in the section of measures later in this report.

3.3 Regarding ways to help Albertans/Edmontonians make responsible choices?

3.3.1 Information and Educational Programs

It is important to inform the public about the choices for energy production and use and to communicate the risks and consequences of the various options. These programs should focus on empowering the individual to act. Programs can be organized through the partnership among government, industry, and other stakeholders and directed at providing service to different sectors of the community and different age groups.

There may also be programs that assist the public in making responsible choices. Programs such as those providing for efficient use of transportation such as public transit); demonstration projects in communities; energy conservation incentive programs; award programs for the recognition of achievements and sponsoring group conservation projects.

3.3.2 Indicators

There is a perceived need for the use of indicators (environmental, energy efficiency and health) as a means of measuring the environment and the tendency towards attaining specific targets and goals. Some possible indicators include rush hour air quality measurements, traffic counts or energy consumption. There is a need to identify a health indicator. Other cities have used air quality indices (Vancouver) and the number of people affected by air pollutants (Oslo).

3.4 Regarding the relationship between an Alberta Strategy (and a strategy for the City of Edmonton) and other provincial, national and international strategies

3.4.1 International Protocols

The CASA workshop has identified the following initiatives regarding the national and international scope of the energy-related emission issue:

(a) The United Nations Economic Commission for Europe protocol agreeing to a 30 percent reduction in national sulphur dioxide reduction is due for renegotiation in 1994;

(b) The Canadian Council of Ministers of the Environment is developing a plan to limit nitrogen oxides and volatile organic compounds in order to meet a United Nations Economic Commission for Europe protocol which agrees to freeze nitrogen oxides emission at the 1987 level by 1994.

(c) The federal government is participating in the development of international protocols to reduce carbon dioxide and other greenhouse gases which will be reviewed in June, 1992 at the Brazil Conference on Environment and Development.

Because Alberta is a major supplier of fossil fuel, it should not carry a dispropriate share of Canada's cost on international agreements for reducing energy-related emissions.

3.4.2 National and International Cooperation

It was recognized that national and international cooperation is necessary to attain goals of emission reduction. This is to ensure fairness and equity. Furthermore, it is necessary to harmonize legislation and policies with other municipal and provincial governments and the federal government. A suggestion from the CASA workshop which is supported by the City was that cost-benefit analyses of the options should be done at the national and international level "to determine where maximum environmental benefits could be achieved per dollar spent".

3.4.3 Science and Technology

Scientific and technological development also need to be coordinated nationally and internationally. Alberta businesses should be encouraged to develop emission reducing or energy saving devices that ultimately can be introduced into the international and national markets. Edmonton may also benefit directly or indirectly from such developments.

4.0 LIST OF MEASURES FOR IMPROVING AIR QUALITY

From the analysis of the various air quality plans, one may obtain a number of measures which are under study or in the process of implementation for other cities or regions. For convenience, these are discussed under the three major categories of (a) Motor vehicles and traffic; (b) CFC's and ozone depletion; and (c) Other measures. Examples of cities or regions implementing or considering the measure are indicated in parentheses. Here, GVRD stands for the Greater Vancouver Regional District, and SCAQMD stands for the South Coast Air Quality Management District of the Los Angeles area. Note that the details of the measures may vary from place to place and the examples are not meant to be exhaustive.

The list is included as information for CASA and for consideration by the City Emissions Sub-Committee of the Interdepartmental Environmental Task Force for possible application to Edmonton. The City of Edmonton does not endorse or disapprove of any of the listed measures at this point.

Two specific projects currently under detailed evaluation by the City of Edmonton are:

a) district energy (Edmonton Power);
b) landfill gas utilization (Environmental Services and Edmonton Power).

4.1 Measures Related to Motor Vehicles and Traffic

4.1.1 Reduce peak hour trips and increase the number of people to vehicles using traffic management bylaws. The purpose is to reduce the number of single-occupant vehicles. (Vancouver, Toronto)

4.1.2 Provide preferential parking and parking pricing that favours high occupancy vehicles in city-owned lots and city streets and to require privately owned parking lots to do the same using city bylaws. (Vancouver)

4.1.3 Make bicycles a better transportation alternative by providing ample bicycle paths, parking and related facilities. (Vancouver, Toronto)

4.1.4 Achieve short-term reductions in emissions of atmospheric pollutant from motor vehicles using high occupancy vehicle facilities. (Vancouver, Toronto, SCAQMD)

4.1.5 Monitor tailpipes for excessive tailpipe emissions (Vancouver, Toronto, SCAQMD)

4.1.6 Establish a hotline for reporting vehicles with excessive tailpipe emission. (Vancouver)

4.1.7 Use road pricing to divert downtown traffic, fund public transit, bicycle facilities or other non-polluting activities. (Vancouver, Singapore, Hong Kong, Stockholm's Trafikplan '89, Holland's Smart Card)

4.1.8 Encourage opportunities for telecommunicating rather than commuting so as to reduce the need for transportation. The idea of a 24-hour city hall may help to provide information by computer access on city activities, services, hearings, etc. (Vancouver, SCAQMD)

4.1.9 Develop energy-efficient land use policies. This would include high density residential developments, the integration of work, residence and shopping in mixed use developments, decentralize commercial and community services to reduce travel distance, etc. (Vancouver)

4.1.10 Make access by proximity rather than by transportation a central focus of city planning. (Vancouver)

4.1.11 Encourage people to work at home so as to reduce the need for transportation. (Vancouver) Encourage alternate work weeks and flextime. (SCAQMD)

4.1.12 Request the province to introduce a regional carbon dioxide tax to fund transportation alternatives. (Vancouver)

4.1.13 Shift away from fossil fuel for city vehicles and improve the fuel composition of the city's vehicle fleet. Conserve energy in municipal operations. (Vancouver, SCAQMD) Explore the potential future of electric and natural gas vehicles. (Toronto, SCAQMD)

4.1.14 Emission standards for the city buses. (Oslo) Emission standard for all vehicles. (SCAQMD)

4.1.15 Ban on the idle running of engines. (Oslo)

4.1.16 Install exhaust cleaning equipment on city buses. (Oslo, SCAQMD)

4.1.17 Better road cleaning and reduce weardown of roads. (Oslo)

4.1.18 Encourage public transit. (Toronto) Encourage use of high speed rail. (SCAQMD)

4.2 Measures Related to CFC's and Ozone Depletion

4.2.1 Banning the use, sale and manufacturing of CFC's and other ozone-depleting chemicals. (Vancouver)

4.2.2 Ensure the effective control, recycling, recovery and disposal of CFC's. (Vancouver, Winnipeg)

4.2.3 Encourage the substitution of non-ozone depleting alternatives for products and processes currently in use. (Vancouver, Winnipeg)

4.2.4 Prefer alternative substances in the city's purchasing policies and contract allocation. (Winnipeg)

4.2.5 Adopt a work policy related to CFC and halon reduction for all city departments. (Winnipeg)

4.2.6 Phase out of the use of methyl chloroform and carbon tetrachloride, which are contributors to ozone depletion but not considered in the Montreal Protocol. (Winnipeg)

4.2.7 Acquire and disseminate knowledge of all matters related to ozone depleting substances. (Winnipeg)

4.2.8 Liaise with provincial and federal governments regarding laws and regulations pertaining to ozone depleting substance. (Winnipeg)

4.2.9 Monitor progress in the development of substitutes and technologies. (Winnipeg)

4.2.10 Liaise with industries and business and implement city bylaw to reduce CFC and halon emissions. (Winnipeg)

4.3 Other Measures

4.3.1 Accelerate methane gas collection by constructing a methane gas collection system. (Vancouver)

4.3.2 Monitor and evaluate progress in reducing emissions of pollutants. (Vancouver) Perform energy audit. (Toronto)

4.3.3 Encourage infrared scanning for energy leakage. (Vancouver)

4.3.4 Implement energy efficient lighting standards for buildings. (Vancouver, Toronto)

4.3.5 Request the province to set energy efficiency standards for appliances. (Vancouver, Toronto)

4.3.6 Plant and nurture city forests and trees in city parks, on city streets and private properties and to regulate the removal, damage or destruction of trees on private property in the City. (Vancouver, Toronto)

4.3.7 Reduce and recycle solid wastes and minimize the use of nondegradable, nonreturnable and nonrecyclable food and beverage packaging. Reduce the amount of household organic waste. (Vancouver, Seattle)

4.3.8 Favour companies with environmentally sound business practices for all city investments and purchasing. (Vancouver, Winnipeg)

4.3.9 Prepare for those consequences of atmospheric change for which we may already be committed. (Vancouver)

4.3.10 Advocate environmentally responsible policies and actions at all government levels. (Vancouver, Toronto)

4.3.11 Share information and projects with other cities of the world to respond to atmospheric change. (Vancouver)

4.3.12 Foster public awareness of the problems and develop public awareness of local initiatives. (Vancouver)

4.3.13 Plant trees in other parts of the world of offset part of the city's carbon emission. (Toronto)

4.3.14 Upgrade the existing district heating system to use energy-efficient cogeneration technology. (Toronto)

4.3.15 Prohibit CFC substitutes that have a strong greenhouse effect. (Toronto)

4.3.16 Disseminate energy-efficiency information to building operators, architects and developers. (Toronto)

4.3.17 Ban on burning of garden rubbish. (Oslo)

4.3.18 Request assistance from regional authority to reduce the present levels of sulphur dioxide emissions from regional sources. (Vancouver)

5.0 KEY COMPONENTS OF AIR QUALITY PLAN FOR A CITY

The City Emissions Sub-Committee of the Interdepartmental Environmental Task Force have contributed to the identification of air quality concerns for Edmonton by providing the major stakeholder feedbacks. The Alberta Research Council study ("Towards an Air Quality Plan for the City of Edmonton") has identified the following five key components (5.1 - 5.5) for an urban air quality plan, with two additional key components (5.6 and 5.7) having been identified by the City of Edmonton during the Council review process. These are under review by the Task Force as preliminary steps towards the development of an air quality plan for the City of Edmonton and will be submitted for Council consideration in Spring, 1991.

5.1 Targets and Goals

The targets and goals of an air quality plan are the quantitative guidelines for air pollutants defined by national or regional strategies. The Federal Clean Air Act (recently replaced by the Canadian Environmental Protection Act) for example, formulate three ranges of National Ambient Air Quality Objectives (NAAQO's) -- tolerable, acceptable and desirable ranges for various air pollutants. The GVRD applies these as the basis for its air quality management program. Other targets may be set by specific federal or provincial policies such as the reduction of CFC's called for in the Montreal Protocol and its update in the London Conference of June, 1990. Such targets often involve a time limit in addition to the pollution reduction guidelines. In addition, individual cities may have their own specific air quality problem and develop their own specific targets. Sacramento has examined the ground level ozone problem, while Winnipeg examines the problem of halons and CFC's. The City of Vancouver considers ozone depleting chemicals, sulphur dioxide, methane and carbon dioxide in its air quality management targets, while the main pollutants for Oslo are sulphur dioxide, nitrogen dioxide, carbon monoxide and soot. It is necessary to identify the targets and goals in the early stage of the development of an air quality management plan.

5.2 Education and Communication

The purpose of this is to foster public awareness of the problems associated with air pollution and to develop public support for various local initiatives and measures by involving the public in the decision-making process. Most individuals tends to look out for what is "mine" and without efforts to communicate and educate, many air quality measures will be perceived as infringements of an individual's freedom. It is necessary to communicate that the most important common freedom is the freedom to breathe and to show the improvements in our overall quality of life in an environmentally friendly society. Specific reference to improving public awareness can be found in the Vancouver and Winnipeg plans and the Report of the Standing Committee on Environment on "Deadly Releases CFC's".

5.3 An Inventory of the Emissions

To assist in the identification of targets and goals, it is necessary to have some indication of where the air quality problems are. This includes the collection of some basic facts and data regarding the existing air quality. Information such as the kinds of air pollutants, their major contributing sources, and the temporal and spatial distribution of various controlling factors are essential background information for a successful air quality management plan. For example, the climatology of the area is an important consideration in the GVRD and Oslo plans. The frequency of atmospheric inversions is a contributing factor to the air pollution problem in the mountainous terrain of GVRD. In Oslo, different fuel is used in their oil heating plants under inversion conditions to avoid trapping of excessive pollutants. In Ontario, where 25 percent of the electricity is generated by coal generating plants for peak hour usage, a reduction in peak hour electricity demand will greatly reduce carbon emissions. The opposite is the case in Alberta where gas is used for peaking. All this means that specific problems of air quality need to be identified through studying and monitoring, considering that individual cities have particular air quality problems of their own. For Alberta, some of these information may be available. For example, the report results for ongoing monitoring by Alberta Environment of pollutants (1989 levels) for the City of Edmonton will be available March, 1991. An inventory of information should be performed to identify gaps.

5.4 Some Form of Cost-Benefit Analysis

The results from cost-benefit analyses can be used as an aid or criteria for the selection of appropriate measures and options to combat air quality problems. The City of Oslo selected their measures based entirely on the cost-to-benefit ratio. While the monetary costs and benefits are important, the more intangible values of health, low noise level and general quality of life should also be considered. Cost benefit analysis is very case-specific. For example, investing in improved efficiency and conservation can lead to a 10 to 20 percent drop in CO_2 emission elsewhere, whereas in Alberta, CO_2 emissions are expected to increase by more than 20 percent in the very near future. Hence, the same measures to improve efficiency and conservation may not produce the same cost-benefit ratio.

5.5 Initiation Within the City Government

The City of Edmonton can lead by applying the measures to its various departments. Most plans reviewed in this study contain strategies to improve energy efficiency and reduce pollution in facilities directly under the jurisdiction of the city. For example, improving the fuel economy of city-owned vehicles, more efficient use of vehicles, and the energy efficiency of city government buildings (Oslo, Los Angeles, Vancouver), developing policies to favour environmentally sound business practices in the city's operation, investments and purchases (Vancouver, Winnipeg). The Vancouver plan even contains a recommendation that the city takes a pro-active role, advocating environmentally responsible policies and actions at all government levels, including municipal organizations in Canada and globally.

5.6 Montreal Protocol With Respect to Chlorofluorocarbon Reduction

The Montreal Protocol and Toronto Conference set the targets and guidelines for the phasing-out of CFC's and other ozone depleting substances. The Alberta cities will probably have to respond by participating in the drive towards the phase-out. It is necessary first to examine the possible measures and obtain some idea of the cost and impacts. The economics of such measures must be considered in the overall plan. Factors such as collection and disposal facilities, the cost and benefits of substitutes and the effects of various phase-out processes must be assessed. For example, if less effective halon substitutes are to be used for fire extinguishers, what is the impact on the efficiency of our fire fighting service? The Winnipeg study may provide some basic information for such investigation.

It is recommended that in anticipation of federal guidelines for the phase-out of CFC's and other ozone-depleting substances, it is desirable to examine the possible phase-out measures and obtain estimates of the costs and impacts at the municipal level with preliminary plans of implementation.

5.7 Provincial and Federal Cost Sharing

The implementation of environmental measures and strategies at the municipal level are to be coordinated with both the Federal and Provincial governments, and probably with other municipalities. This includes the development of targets, schedules, and resources. Cost and information sharing are two important areas which facilitates both development and implementation. It is important to examine ways by which information and experiences can be exchanged and funding and resources (including expertise, equipments and facilities) can be shared.

It is important to investigate ways by which environmental measures can be effectively implemented through the sharing of costs, information and other resources with the Federal, Provincial and other municipal governments. The City of Edmonton recommends that, because of the national and international scope of the air quality issues, the Provincial and Federal governments provide adequate funding to address the required environmental measures such as funding required for the phase-out of CFC's.

6.0 ELECTRIC UTILITY INITIATIVES BY SENIOR GOVERNMENTS

6.1 Regulatory/Policy Changes

An important barrier to innovative emission reduction options is excessive uncertainty. Innovation is already inherently risky. Government policy or lack of clear policy can add substantially to this level of risk by imposing further uncertainty. The following regulatory/policy changes are recommended.

6.1.1 The regulatory approval process should be clear with regard to federal-provincial roles, free of duplication, and provide a reasonable level of certainty as to timing and closure.

6.1.2 Currently the rules regarding the treatment of Demand Side Management (DSM) investment costs are evolving on a piecemeal basis. It is recommended that government move expeditiously to address this issue in consultation with the electric utilities and other key stakeholders.

6.1.3 Clear cost allocation rules are required for cogeneration projects to reduce the economic uncertainties while ensuring the equitable treatment of stakeholders:

- In the case of heat produced as the result of an industrial process being used to generate electricity, the costs should be fairly allocated between the industry and the electricity customer.

- In the case of waste heat from an electric utility generating station being used to provide usable energy, the costs should be fairly allocated between the electricity customer and the energy customer.

In both cases the rules should be such that the costs paid by the electricity customer are unaffected. In other words the electricity customer should be indifferent to the cogeneration project cost.

6.1.4 The question of recovering the cost of emission reductions beyond current regulatory requirements should be addressed in consultation with the electric utilities and other key stakeholders. Lack of rules will discourage a flexible and cost-effective approach.

6.1.5 Environmental approvals to construct should reassure investors by guaranteeing that the terms and conditions will remain unchanged for some reasonable period of time. Approval conditions with a guaranteed finite life will also be necessary if an emissions trading approach is contemplated.

6.2 Incentives

6.2.1 Where new source performance standards are considered, the appropriate means of managing future electric plant emissions, these standards should be based on marketable energy output and not energy input. This would provide an incentive to maximize plant energy efficiency.

6.2.2 An immediate incentive should be given to companies to invest in ventures now which reduce emissions beyond their legal requirements. This incentive could be easily established by recognizing all such emission reductions since 1990 as banked credits against future emission standards, local airshed constraints permitting.

CLEAN AIR STRATEGY FOR ALBERTA

A PRESENTATION BY THE CITY OF CALGARY

1990 DECEMBER 5

INTRODUCTION:

MR. CHAIRMAN AND GUESTS. THE CITY OF CALGARY IS PLEASED TO PRESENT OUR VIEWS ON THE NEED FOR IMPROVED AIR QUALITY IN THIS CITY AND ON THE CLEAN AIR STRATEGY FOR ALBERTA. THE PREPARATION OF THE CLEAN AIR STRATEGY IS A NOTEWORTHY ACCOMPLISHMENT AND MAYOR AL DUERR AND MEMBERS OF CITY COUNCIL WOULD LIKE TO COMPLIMENT THE GOVERNMENT OF ALBERTA FOR TAKING THIS INITIATIVE.

PRESENTATION:

CALGARY'S CITY COUNCIL IS SERIOUSLY CONCERNED ABOUT THE DECLINING AIR QUALITY WITHIN THIS PROVINCE, PARTICULARLY WITHIN THE CITY OF CALGARY. WE ARE VERY PLEASED THAT THE PROVINCIAL GOVERNMENT HAS UNDERTAKEN THESE PUBLIC MEETINGS.

CITY COUNCIL AGREES IN PRINCIPLE THAT ENERGY-RELATED EXHAUST EMISSIONS, WHETHER FROM AUTOMOBILES OR INDUSTRIAL PROCESSING, POSE A POTENTIAL ENVIRONMENTAL HEALTH RISK FOR ALBERTANS; AND, WE LIKEWISE AGREE THAT THE ISSUE OF 'CLEAN AIR' IS A COMPLEX SCIENTIFIC AND GLOBAL MATTER THAT IS INTRICATELY INTERWOVEN INTO ALL ASPECTS OF OUR SOCIETY. ONE DOESN'T HAVE TO LOOK FAR IN THIS CITY TO REALIZE THAT THE FOUNDATION OF OUR ECONOMY IS THE ENERGY INDUSTRY. YET, WE ALSO RECOGNIZE THAT THE AIR WE BREATH AND ITS EFFECTS ON OUR HEALTH MUST BE A GREATER CONCERN AND PRIORITY TO

US, AS A SOCIETY, THAN THE ECONOMIC GAINS ACHIEVED BY CONTINUING TO CONSUME OUR FOSSIL FUEL RESOURCES (ON THE SCALE WE DO) TO MEET EVER INCREASING ENERGY DEMANDS. WE MUST WEIGH HUMAN HEALTH AND ENVIRONMENTAL CONSIDERATIONS IN RELATION TO ECONOMIC CONSIDERATIONS. OUR SOCIETY IS QUICKLY REALIZING THAT OUR SMALL AND RATHER FRAGILE WORLD CAN WITHSTAND ONLY A CERTAIN AMOUNT OF SUSTAINED ENVIRONMENTAL ABUSE. I WOULD SUGGEST, MR. CHAIRMAN, THAT THE TIME FOR ALBERTANS AND CALGARIANS TO ACT IS NOW.

THE CITY OF CALGARY DOES SUPPORT THE PURPOSE AND OBJECTIVES OF THE CLEAN AIR STRATEGY FOR ALBERTA, AND WE WANT TO WORK AS A PARTNER WITH THE PROVINCIAL GOVERNMENT TO IMPLEMENT IT. WE ENDORSE, IN PRINCIPLE, THE NATIONAL AND INTERNATIONAL COMMITMENTS MADE FOR EMISSION STANDARDS OF CARBON DIOXIDE, SULPHUR DIOXIDE, NITROGEN OXIDES, VOLATILE ORGANIC COMPOUNDS AND CHLOROFLUOROCARBONS. WE FULLY RECOGNIZE THAT

CONSUMERS AND THE ENERGY INDUSTRY IN THIS PROVINCE, AS THE LARGEST PRODUCER OF FOSSIL FUEL ENERGY IN CANADA, WILL BE IMPACTED TO A SIGNIFICANT DEGREE. THE ENERGY INDUSTRY, AND THE CONSUMERS OF THESE RESOURCES, MUST RECOGNIZE THE IMPACT WE ARE MAKING. MAYBE WE MUST WORK HARDER AT DEVELOPING BETTER TECHNOLOGY SO THAT EMISSIONS WILL BE CLEANER AND WE WILL SEE AN IMPROVEMENT IN THE AIR WE BREATH. YES, ALBERTA IS ONLY ONE SMALL PART OF THE WORLD'S AIR POLLUTION PROBLEM; BUT, IF A START IS NOT MADE SOMEWHERE, THEN HOW DO WE SOLVE OUR WORLD-SCALE PROBLEMS?

THIS PUBLIC MEETING IS AN OPPORTUNITY TO NOT ONLY PROMOTE THE CLEAN AIR STRATEGY FOR ALBERTA, BUT ALSO FOR THE CITY OF CALGARY TO HIGHLIGHT THE ACTIONS THAT WE, AS A CORPORATION, ARE UNDERTAKING TO ILLUSTRATE THAT WE ARE SERIOUS ABOUT OUR COMMITMENT TO CLEAN UP CALGARY'S AIR. A RECENT PUBLIC OPINION SURVEY INDICATES THAT CALGARIANS, ON THE WHOLE, PLACE A HIGH

VALUE ON PROTECTING THIS CITY'S AIR QUALITY. COUNCIL HAS HEARD THIS MESSAGE AND HAS ACTED WITH A NUMBER OF INITIATIVES TO BEGIN THE SLOW PROCESS OF REDUCING HARMFUL CHEMICAL EMISSIONS INTO OUR ATMOSPHERE. SEVERAL EXAMPLES OF RECENTLY INITIATED AIR QUALITY ENHANCEMENT PROJECTS IN CALGARY ARE:

> THE AIR IMPROVEMENT RESOLUTION (AIR CALGARY) PROGRAM, WHICH ENCOURAGES MOTORISTS TO LEAVE THEIR VEHICLES AT HOME ONE IN EVERY 10 WORK DAYS, AND INSTEAD USE AN ALTERNATE MEANS OF TRANSPORTATION TO WORK INCLUDING CAR POOLING, TRANSIT, BICYCLING, WALKING, ETC. THE IDEA IS TO REDUCE THE NUMBER OF VEHICLES ON THE ROAD.
>
> CALGARY TRANSIT IS WORKING ON IMPROVEMENTS TO PUBLIC TRANSIT FOR THE PURPOSE OF ENCOURAGING GREATER RIDERSHIP, RESULTING IN FEWER VEHICLES ON THE ROAD, PARTICULARLY DURING RUSH HOURS. CALGARY

TRANSIT IS MONITORING ALTERNATE ENERGY PILOT PROJECTS FOR BUSES WITH A VIEW TO IMPLEMENTING PROVEN TECHNOLOGIES AT THE EARLIEST PRACTICAL DATE.

THE CITY IS ENCOURAGING CONSUMERS AND BUSINESSES TO REDUCE THE USE OF PRODUCTS CONTAINING OR MANUFACTURED WITH THE USE OF HARMFUL PRODUCTS, SUCH AS CFC'S AND HALONS; AND, TO BE GENERALLY MORE CAUTIOUS AND RESPONSIBLE WITH ENVIRONMENTAL HARMFUL OR HAZARDOUS GASEOUS MATERIALS, SUCH AS CARBON DIOXIDE.

THE CITY IS PREPARING A BYLAW TO CONTROL CFC/HALON STORAGE, HANDLING, VENTING AND ACCIDENTAL ESCAPES PRIMARILY TO REDUCE AND REGULATE THE AMOUNT OF THESE MAN-MADE PRODUCTS ENTERING THE ATMOSPHERE.

THE CITY ENCOURAGES TECHNOLOGICAL ADVANCES WHICH WILL REDUCE VEHICLE AND INDUSTRIAL EXHAUST EMISSIONS, AND ENSURES GREATER HEALTH, PERSONAL SAFETY AND SECURITY AT LOCATIONS SUCH AS SOUR GAS WELLHEADS; AND, TECHNOLOGY WHICH WILL LEAD TO FEWER NATURAL AND ACCIDENTAL ESCAPES OF HARMFUL VAPOURS INTO THE ATMOSPHERE.

THE CITY HAS AN ENERGY CONSERVATION PROGRAM FOR BUILDINGS AND PLANTS THAT IT OPERATES AND EXPENDS FUNDING ANNUALLY TO RETROFIT FOR ENERGY SAVINGS. NEW FACILITIES ARE DESIGNED WITH ENERGY CONSERVATION IN MIND.

THE CITY IS SETTING AN EXAMPLE BY CONVERTING AN EVER INCREASING NUMBER OF ITS POLICE CAR AND OTHER LIGHT FLEET VEHICLES TO PROPANE OPERATION; THE CITY IS ALSO INVESTIGATING ALTERNATIVE FUELS, INCLUDING NATURAL GAS AND METHANOL, FOR OTHER VEHICLES IN THE CITY'S FLEET.

CALGARY TRANSIT PROMOTES USE OF PUBLIC TRANSIT BY PROCLAIMING A TRANSIT AWARENESS WEEK. THE CITY ENCOURAGES PROVINCIAL ASSISTANCE WITH TRANSIT OPERATING EXPENDITURES THROUGH INCREASED GRANTS AND APPLAUDS THE CONTINUED PROVINCIAL SUPPORT THROUGH THE GRANT STRUCTURE FOR CAPITAL EXPENDITURES.

THE TRANSPORTATION DEPARTMENT'S TRAFFIC OPERATIONS DIVISION OPERATES A TRAFFIC SIGNAL LIGHT PROGRESSION PROGRAM TO MOVE VEHICLES THROUGH THE BUSY CORE AREA MORE EFFICIENTLY.

THE CITY HAS ESTABLISHED AN ENVIRONMENTAL OFFICE AS A DIVISION OF THE ENGINEERING AND ENVIRONMENTAL SERVICE DEPARTMENT TO COORDINATE THE CITY'S

INVOLVEMENT IN, AND TO COMMENT ON, MATTERS RELATING TO THE ENVIRONMENT, INCLUDING AIR QUALITY ISSUES.

THESE ARE BUT A FEW OF THE INITIATIVES THE CITY OF CALGARY IS UNDERTAKING AS A PROACTIVE MEASURE TO IMPROVE THE CITY'S AIR. THE CITY OF CALGARY INTENDS TO CONTINUE TO BE PROACTIVE IN IMPLEMENTING INITIATIVES WHICH WILL HAVE POSITIVE EFFECTS ON OUR AIR QUALITY IN THE FUTURE.

AN IMPACT ON THE AIR QUALITY IN THIS PROVINCE WILL BE FELT IN TIME, ONCE RESIDENTS BEGIN TO ACCEPT THAT THERE IS A NEED TO CHANGE THEIR BUSINESS PRACTICES, DRIVING AND LIFESTYLE HABITS. THE CITY'S PART IN THE CLEAN AIR STRATEGY FOR ALBERTA IS MINOR, AT LEAST IN A GLOBAL SENSE, BUT ON A LOCAL SCALE WE ARE CONFIDENT THAT CALGARIANS WHO LIKE A CHALLENGE WILL RISE TO THE OCCASION. CALGARIANS' CONTRIBUTION TOWARD CLEANING UP

OUR AIR WILL BE MADE VOLUNTARILY AND WITH ONLY MODEST ADJUSTMENTS OR RESTRUCTURING TO OUR LIFESTYLES. WE WILL HAVE TO VOLUNTARILY REDUCE VEHICLE USAGE TO ESSENTIAL TRAVEL; WE WILL HAVE TO CONTROL HARMFUL EMISSIONS MORE STRICTLY; AND, WE WILL NEED TO CAPITALIZE ON ALTERNATE MODES OF TRANSPORTATION - WHETHER THAT BE PUBLIC TRANSIT, CAR POOLING, WALKING OR CYCLING. CALGARIANS MUST BE WILLING TO MAKE CONCESSIONS; AND, TO TAKE CHARGE OF OUR LOCAL ENVIRONMENTAL PROBLEMS SO THAT OUR COMMUNITY AS A WHOLE WILL BE EXPOSED TO FEWER AIR POLLUTING AND ATMOSPHERE-ALTERING EMISSIONS.

SUMMARY

In summary, the Government of Alberta's Clean Air Strategy is a positive move toward setting and meeting fair and reasonable air emission standards set for carbon dioxide, sulphur oxides, nitrogen oxides, volatile organic compounds and methane. Calgarians, for the most part, acknowledge we have a world-wide air quality crisis and most are prepared to voluntarily make measurable - possibly even significant - changes and sacrifices to their lifestyles and to the way they conduct business.

Thank you, Mr. Chairman, for this opportunity to show support for the Clean Air Strategy for Alberta. We have a long way to go, so lets ~~begin~~ CONTINUE the journey together.

1990 December 03

Canadian
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office**

**bureau de
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February 13, 1991

Mr. Myron Kanik
Deputy Minister
Room 228, Legislative Building
Edmonton, Alberta
T5K 2B6

Dear Mr. Kanik:

The pulp and paper industry has prepared and is making public its statement on a matter of major environmental importance, namely, global climate change. The document, A Statement by the Pulp and Paper Industry: Global Climate Change, is enclosed for your information.

Global climate change is an international problem requiring international solutions. The ongoing scientific and political process working towards a multinational agreement is important, and should lead to the kinds of worldwide focus and effects necessary to address the problem.

The forest sector is a major industrial component of the Canadian economy and consequently a large energy user. In the pulp and paper industry, conservation and conversion to biomass fuels have significantly reduced purchased energy requirements per tonne of product. Continued voluntary conservation programs will further improve efficiency. At this time, approximately 75 percent of the industry's fuel is derived from wood waste. The carbon dioxide emitted from this source is more than balanced by forest renewal and growth.

The forest itself is a "reservoir" for carbon as are lumber in use and paper products in use and being recycled. The industry believes that, overall, the forest sector is a net growing reservoir of carbon. Further conservation, intensive forestry and recycling will enlarge this reservoir and help reduce atmospheric carbon dioxide.

I hope you find the statement informative and useful in policy deliberations on the matter of global climate change.

Yours truly,

Howard Hart

Howard Hart
President

A STATEMENT
BY THE PULP AND PAPER INDUSTRY

ENVIRONMENT

GLOBAL CLIMATE CHANGE

Prepared and issued by:

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VIEWPOINT

Increases in atmospheric concentrations of greenhouse gases above pre-industrial levels are well documented. Various human activities are the sources of these increases. Temperatures appear to be increasing at the earth's surface. Some scientists suggest this is caused by increased atmospheric greenhouse gas concentrations. Projections of the rate and the pattern of these changes are not estimated with much confidence.

Global climate change is an international issue which requires cooperation among nations to achieve solutions; unilateral actions will not solve it. The pulp and paper industry supports the international scientific and political process, now well underway, which will lead to conventions among governments. The industry will support actions to address the problem in the area of energy conservation and carbon reservoir enhancement in forests and forest products.

The pulp and paper industry believes that global climate change could have important consequences to the natural environment and to society. Actions must be taken to reduce the risk of damage to the environment and to natural resources. Overall, the forest products industry — its resource, its manufacturing processes, its products in use and in recycle — can contribute to reducing the risk of damage.

The Canadian forest industry is a large and important sector of the economy, producing products which directly or indirectly provide employment for one-tenth of the nation. It is also an emitter of carbon dioxide. However, in pulp and paper manufacturing, more than 75 percent of that carbon dioxide is emitted from the use of renewable biomass fuel which comes from trees. This biomass fuel provides an increasing portion of the industry's energy requirements. Unlike biomass fuels, the use of fossil fuels results in a net addition of carbon dioxide to the atmosphere. Biomass carbon dioxide, on the other hand, is part of the natural cycle of the forest and the atmosphere.

The pulp and paper industry believes that carbon dioxide emissions must be limited, carbon reservoirs must be expanded, uncertainties in the science must be reduced, and the means to adapt to change must be developed. The industry remains committed to voluntary energy conservation efforts. More intensive forestry and the establishment of new forests can expand carbon storage. Also, forest products such as lumber in permanent structures and paper in recycle are long-term carbon storehouses.

REDUCING EMISSIONS – A CONSERVATION STRATEGY

Strategies to limit or reduce greenhouse gas emissions will only be successful if they are implemented on an international scale. Emission-limiting targets and strategies must be based on an evaluation of risk and impact.

Programs to control increases in man-made greenhouse gas concentrations must consider sources, carbon cycles and sinks. All energy sources should be available for use, providing their real economic, environmental and social costs are considered. Emissions from biomass fuels should be accounted for separately from fossil fuels. There are, no doubt, efficiencies which should be pursued in energy derived from biomass fuels. However, if these fuels come from sustained yield forests, the carbon dioxide emitted from their use is recycled in forest growth.

Energy conservation is an important part of limiting greenhouse gas emissions. The pulp and paper industry reaffirms its commitment to a voluntary national energy conservation program aimed at improvements in transportation and manufacturing processes that further reduce fossil fuel usage through improved energy efficiency, cogeneration and conversion to biomass fuels.

In collaboration with governments, the industry will promote research, development and technology transfer efforts to improve energy efficiency. Research coordination and cooperation at international levels are needed.

CARBON RESERVOIRS – FORESTS AND FOREST PRODUCTS

Forests and forest products are storehouses of carbon. Increasing the amount of carbon stored in these reservoirs will help reduce atmospheric concentrations of carbon dioxide.

Vigorously growing, healthy forests absorb large volumes of carbon dioxide through photosynthesis. Sound forest management will ensure those healthy forests. Intensification of forest management and afforestation of marginal agricultural lands will increase annual growth rates, and expand the carbon reservoir. Governments and industry must develop and promote the use of forest management and silvicultural practices that will maintain or enhance the carbon sink capacity of industrial forests and forest soils.

Intensifying forest protection measures to combat fires, disease and insect infestations will help ensure a healthy forest. Canadian forest fire control technology is world class and has had great success in reducing damage. Its further development and increased use must remain a high priority. This technology is an important contribution that Canada can make to resource protection throughout the world.

The pulp and paper industry is making a substantial commitment to and investment in facilities to recycle its products. This will result in reductions of paper in landfills and incinerators, and create a larger store of carbon in use. Solid wood products used in permanent structures also provide long-term storage of wood and carbon.

Trees in towns and cities — the urban forest — make an important contribution to energy conservation by protecting homes and other buildings from the extremes of heat and cold. Building this urban forest offers us all an opportunity to reduce energy use.

REDUCING UNCERTAINTIES

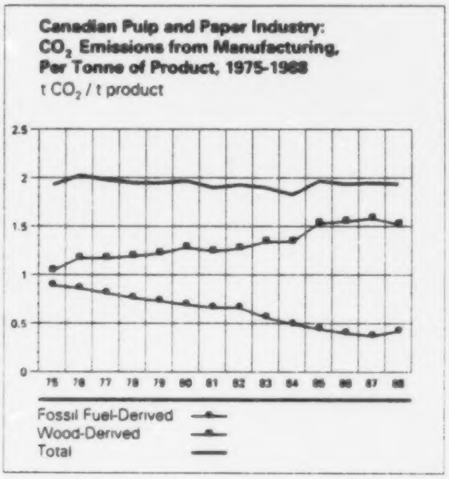
Although there is substantial agreement among scientists on many aspects of climate change, there remain important unknowns which make predictions uncertain.

A cooperative, coordinated, international research program is urgently needed; decisions about future actions aimed at mitigation of and adaptations to climate change will only be as good as the information upon which they are based. More investigation must be done on emission levels, chemistry, and atmospheric composition, as well as environmental monitoring for possible effects. There are serious deficits in climatic data and there is the need for continued improvement of general circulation models used to predict climate change.

IN SUMMARY

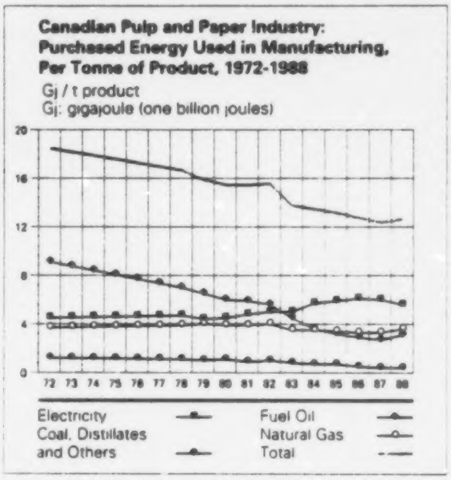
The pulp and paper industry supports an international effort to understand and address the subject of global climate change. Reducing scientific uncertainties is a high priority. Energy conservation, fuel substitution, intensive stewardship of the renewable forest resource, recycling pulp and paper products, and the use of solid wood products are important components of an effective global strategy.

FIGURE 1

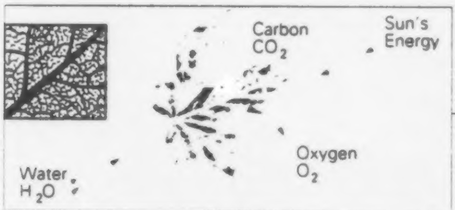

Canadian Pulp and Paper Industry: CO_2 Emissions from Manufacturing, Per Tonne of Product, 1975-1988

t CO_2 / t product

FIGURE 2

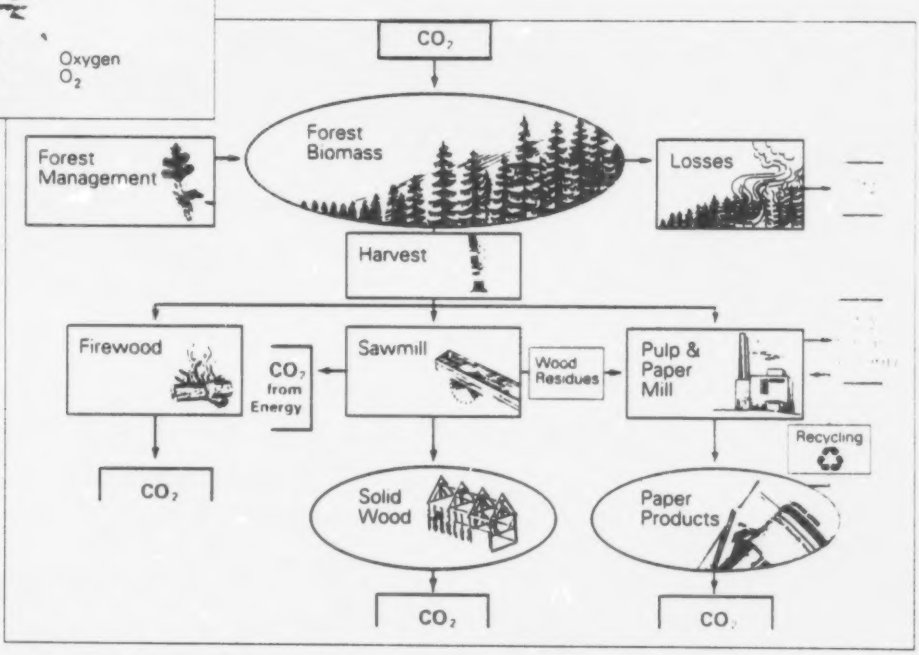

Canadian Pulp and Paper Industry: Purchased Energy Used in Manufacturing, Per Tonne of Product, 1972-1988

Gj / t product
Gj: gigajoule (one billion joules)


Carbon
CO_2
Sun's Energy
Oxygen
O_2
Water
H_2O

PHOTOSYNTHESIS

FIGURE 3 – FOREST SECTOR CARBON FLOW


CO_2
Forest Management
Forest Biomass
Losses
Harvest
Firewood
Sawmill
Pulp & Paper Mill
CO_2 from Energy
Wood Residues
Recycling
CO_2
Solid Wood
Paper Products
CO_2
CO_2

The forest ecosystem withdraws carbon dioxide from the atmosphere through the process of photosynthesis, storing the carbon in the plants, leaves, and the soil. The storage of carbon in forest ecosystems and forest products is an effective means of controlling carbon dioxide emissions. The oval symbol represents the forest sector carbon reservoirs.

GLOBAL CLIMATE CHANGE AND THE FOREST SECTOR: A DISCUSSION

INTRODUCTION

The increase in the concentration of carbon dioxide and other 'greenhouse' gases in the atmosphere, and their potential impact on global climate, are currently subjects of extensive scientific and political discussion internationally. The pulp and paper industry is participating in efforts to reduce uncertainty, to improve understanding, and to define appropriate strategies and actions to mitigate potential problems.

If, as some scientists predict, significant climate change occurs, there will be a major impact on society as a whole. The forest sector, which is dependent on climatic and soil conditions, could be subject to major changes in species distribution, in growth rate, and in susceptibility to insects, disease and fire.

Unlike acid rain, which has an impact at the regional level, climate change is a truly global issue. Because of this global nature, the issue is being addressed quickly by the scientific community and by international organizations such as the World Meteorological Organization and United Nations Environmental Program under their Intergovernmental Panel on Climate Change (IPCC).

WHAT IS THE GREENHOUSE EFFECT?

The glass of a greenhouse allows sunlight to stream in freely but prevents heat from escaping, mainly by trapping the warm air inside the greenhouse. In much the same way, carbon dioxide and other greenhouse gases allow the short wavelength sunlight to pass through the atmosphere and reach the earth's surface. Some longer wavelength radiant heat emitted by the earth is trapped by the greenhouse gases so that less long-wave radiation escapes to space. The result is that heat is trapped in the lower portion of the atmosphere.

The greenhouse effect is a natural phenomenon which has kept and continues to keep the average temperature of the Earth at 15°C, 33°C warmer than it would otherwise be. It is this natural greenhouse effect which makes life on earth possible. But emissions resulting from human activities have increased the atmospheric concentration of greenhouse gases: carbon dioxide, methane, nitrous oxide and chlorofluorocarbons (CFCs) - (see Table 1). Circumstantial evidence has led scientists to believe that these increases will enhance the greenhouse effect, and could result in an additional warming of the earth's surface. It is also estimated that the concentration of water vapour, also a greenhouse gas, will increase in response to global warming, and will enhance this phenomenon.

TABLE 1 – CONCENTRATIONS OF GREENHOUSE GASES AFFECTED BY HUMAN ACTIVITIES

	Carbon dioxide	Methane	Nitrous Oxide	CFC-11	CFC-12
Atmospheric concentration	ppb	ppb	ppb	ppb	ppb
Pre-industrial (1750-1800)	280,000	800	288	0	0
Present day (1990)	353,000	1,720	310	0.280	0.484
Current rate of change per year	1,800	15	0.8	0.0095	0.017
Current rate of change (%)	0.5	0.9	0.25	4.0	4.0

Reference: IPCC, 1990
ppb: parts per billion by volume

Since the industrial revolution, deforestation and the combustion of fossil fuels have led to a 26% increase of carbon dioxide concentration in the atmosphere. Methane concentration has more than doubled because of rice production, cattle rearing, coal mining, and ventilation of natural gas. Fossil fuel combustion may have also contributed to the increased methane concentration through chemical reactions in the atmosphere that reduce the rate of removal of methane. Chlorofluorcarbons, which were not present in the atmosphere before their invention in the 1930s, are used as aerosol propellants, solvents, refrigerants and foam blowing agents.

Various greenhouse gases have different climatic impacts depending on their emission rate, the amount of time they stay in the atmosphere, and their radiative efficiency. Radiative efficiency is defined as the efficiency of a gas to absorb and re-emit long-wave radiation, compared with carbon dioxide (see Table 2). Based on relative radiative efficiency, the increase of all greenhouse gases due to human activities since pre-industrial times is equivalent to an increase of carbon dioxide of about 50 percent.

TABLE 2 – COMPARISON OF VARIOUS GREENHOUSE GASES

	Carbon dioxide	Methane	Nitrous Oxide	CFC-11	CFC-12
Current emissions Mt/yr	16,000 to 29,000	135 to 395	16 to 28	0.330	0.440
Radiative efficiency relative to CO_2	1	70	160	4,700	6,200
Lifetime (yrs)	40 to ?	7-10	150	75	110

Reference: Environment Canada, 1990
Mt: Mega metric tonnes or million tonnes

COMPUTER MODELS

General atmospheric circulation models have been used to provide estimates of climatic changes caused by emissions of greenhouse gases. These models predict that, with current trends and rates of emissions of greenhouse gases, we will experience an increase of global mean temperatures during the next century. Many uncertainties exist around the rate and extent of climate predictions. The role of clouds, oceans and polar ice sheets in relation to climate must be clarified. Each of these elements could influence the magnitude, the pattern and the timing of climate change. Furthermore, it is very difficult to predict possible impacts at the regional level because the degree of confidence in predictions of regional climate change is even lower than for global temperature change.

Global warming, if it occurs, will be accompanied by changes in precipitation levels and water supply patterns, and shifts in vegetation zones. These changes and the potential increase of sea level could modify demographic distribution and impact trade patterns. For the forest ecosystem, physical stresses, susceptibility to and damage by insects and diseases, as well as fire damage, may increase. Timber production could increase or decrease, depending on the availability, of water and nutrients and the forests' capacity to adapt to changes.

THE CANADIAN FOREST SECTOR AND THE CARBON CYCLE

The forest sector releases carbon into the air through its manufacturing processes and transportation activities. Canada emits two percent of the world's carbon dioxide. The Canadian pulp and paper industry is a significant carbon dioxide producer: its manufacturing processes account for almost 10 percent of the country's total domestic energy use. However, more than 75 percent of the pulp and paper industry's carbon dioxide emissions come from renewable biomass-derived fuel sources (Figure 1) that would eventually decay and produce carbon dioxide in any case. Industry has a long-standing commitment and record of fossil fuel use reduction per tonne of production. Figure 2 shows that, through various energy conservation programs and fuel substitution, the industry has reduced fossil fuel usage, per tonne of production, by 50 percent over the past 15 years.

As shown in Figure 3, the forest ecosystem withdraws carbon dioxide from the atmosphere through a process called photosynthesis, storing the carbon in the plant's biomass. Some biomass, annual plants and leaves, for example, represent short-term storage; the remaining carbon is sequestered in the woody tissues and soil for long periods.

Certain natural processes and forestry activities such as harvesting, slash burning, wildfire, peatland drainage, and natural decay, release carbon into the atmosphere.

Other forestry activities replenish the forest biomass carbon reservoir. These same activities could be used to enhance and expand the reservoirs to help offset emissions from fossil fuel consumption. They include: increasing growth of forests through intensive silviculture; afforesting treeless areas; improving the protection of the forest; and reforesting areas immediately after harvest.

Attempts are currently underway to quantify the forest sector carbon flow. Results to date have shown that overall the forest sector is storing slightly more carbon than it is releasing. The total carbon reservoir is growing.

Many suggest planting trees as a way to offset the increase of carbon dioxide emissions. Assuming a conservative growth rate of four cubic metres of merchantable wood per hectare per year, it is estimated that each hectare of plantations will sequester 2.2 tonnes of carbon per year, or the equivalent of the annual carbon dioxide emissions of 1.4 automobiles.

The forest sector helps to store carbon and to reduce emissions of carbon dioxide by producing various forest products like lumber, which may last for decades or centuries before it decays or is burned.

Recycling of forest products is gaining in popularity in North America. This trend also helps to increase the forest products carbon reservoir.

In construction, the substitution of energy-intensive materials with wood products decreases the energy requirements and thereby reduces carbon dioxide emissions.

Additional copies of this document are available, in French or in English, from:

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January 1991

RESEARCH NEEDS

Human-induced climate change could have consequences for the world's social, economic and natural systems, but there are substantial scientific uncertainties over the existence of global warming, its magnitude, and its rate of change.

More research is needed to reduce the uncertainties. Improvement of general circulation models used for prediction should be a high priority. Roles of polar ice sheets, oceans and clouds should be clarified.

Establishment of national and international monitoring networks should be accelerated to monitor climate and biosphere responses to change. Data standardization and quality assurance are also important considerations.

Forecasting responses to different climatic changes for various components of the biosphere should be studied. These include responses by forest stands and species distribution. Ways and means of mitigating potential impacts, especially the value of forests and forest management in the global carbon cycle, should also be investigated.

Sources and sinks of greenhouse gases should be better understood. Greenhouse gas budgets should be developed for various sectors.

REFERENCES

Environment Canada, 1990. CO2 Climate Report. No. 90-01.

Intergovernmental Panel on Climate Change, 1990. The IPCC Scientific Assessment. Cambridge University Press, Cambridge U.K. 365 p.

THE COAL ASSOCIATION OF CANADA

March 4, 1991

Clean Air Strategy for Alberta
Bag One, Mail Room
9945 - 108 Street
Edmonton, Alberta
T5K 2G6

Dear Sir:

RE: CLEAN AIR STRATEGY FOR ALBERTA
COAL ASSOCIATION OF CANADA RESPONSE

The Alberta Coal Industry Senior Executive Committee of the Coal Association of Canada hereby submits its position paper on the air quality issues that are being addressed by the Ministers of Energy and Environment.

As stakeholders, we trust our views and concerns as discussed in the enclosed paper will be taken into account in the formulation of policies and actions of the government.

Also enclosed is a copy of the Coal Association of Canada's position paper on atmospheric change and potential global warming.

Yours truly,

THE COAL ASSOCIATION OF CANADA

Paul J Scott

P.J. Scott, Chairman
Alberta Coal Industry Senior Executive Committee

PJS:cap

cc: Mr. N. MacMurchy, Assistant Deputy Minister, Alberta Energy
Mr. K.R. Smith, Assistant Deputy Minister, Alberta Environment

Suite 502, 205 Ninth Avenue S.E., Calgary, Alberta T2G 0R3 Telephone: (403) 262-1544, Fax: (403) 265-7604

A SUBMISSION TO

THE CLEAN AIR STRATEGY FOR ALBERTA

by

THE COAL ASSOCIATION OF CANADA

February, 1991.

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INTRODUCTION

The Coal Association of Canada (CAC) welcomes the opportunity to contribute to the Clean Air Strategy for Alberta (CASA). The CAC represents coal producers and utility companies that rely on the combustion of coal for the generation of electrical energy. Specifically, the stakeholders represented by this submission are: Fording Coal Ltd., Luscar Ltd., Manalta Coal Ltd., Smoky River Coal Ltd., Alberta Power Ltd., Edmonton Power Ltd., and TransAlta Utilities Corp.

Coal development activities include coal mining, coal storage and transport, and power generation, all of which are regulated in part through licences issued under the Clean Air Act. The coal industry, therefore, has a direct interest in the CASA since this initiative has the potential to affect the extraction and use of Alberta's most abundant energy resource and to affect ultimately the prosperity of Albertans. *As a stakeholder in the CASA, the CAC supports a thorough analysis of air quality issues as a basis for prudent policy and regulation making.* The CAC has been a partner with government in the development of reclamation and water quality standards, and we similarly offer our commitment to the development of a fair and effective CASA.

PERSPECTIVE

Alberta has the natural advantage of huge economically retrievable coal reserves. *Alberta's coal reserves contain over twice as much energy potential as that of the Province's oil, natural gas, and oil sands reserves combined. As a result of the abundance of accessible, low-cost, low-sulphur coal, about 85 to 90 per cent of all electricity in Alberta is produced by coal-fired generating stations.* These natural advantages have made coal the fuel of choice for electrical energy production in Alberta. Provincial policy supports the use of coal-fired plants for base load electricity requirements.

Albertans can look to coal as an energy source that will be available far into the future. By any reasonable scenario of energy demand into the foreseeable future, coal will be able to provide electrical energy for up to hundreds of years. Unlike other fossil fuel sources, resource sustainability is not an issue for coal in Alberta.

Alberta's eleven major coal mines produce some 30 million tonnes of coal annually. Alberta benefits in numerous ways by having a vibrant coal mining industry: low-cost supply of electricity; direct employment of over 2,400 people in the mining industry plus over 5,400 people at utilities; contributions to municipal taxes, royalties and lease payments, and provincial income tax.

Alberta's coal industry is a highly regulated industry. The "Coal Development Policy for Alberta" governs virtually every aspect of coal development in Alberta. The coal industry is regulated mainly under The Coal Conservation Act, The Clean Water Act, the Clean Air Act and The Land Surface Conservation and Reclamation Act. These Acts and associated regulations govern coal mining operations from construction through to abandonment by the use of approvals, permits, licences, annual reports, and frequent government inspections. In addition, coal development approvals are closely linked with the approval process for electrical generating stations. This process includes the Energy Resources Conservation Board, Alberta Environment regulatory agencies, the Public Utilities Board and the Electricity Marketing Board. In many instances, the costs of ever-increasing regulations can be absorbed but Alberta's metallurgical coal mines must compete on world markets, and increased cost of regulations threaten the viability of some mines.

AIR QUALITY ISSUES

Most of the coal mines in Alberta are surface mining operations, located primarily in rural areas. Since these mines are essentially earth-moving operations, the production of dust and air borne coal fines is unavoidable but their cumulative impact is similar to that of the agricultural tillage and fallowing operations that typify the settings of all prairie strip mines. The major mitigative measures applied to control dust at coal mines are road watering and establishment of vegetative cover on disturbed sites as part of ongoing reclamation operations.

The coal industry's reliance on fuel driven heavy equipment such as draglines, coal haulers and dozers requires industry to be constantly vigilant of improvements in mechanical technology and equipment fleet utilization. Our producing mines can all point to significant improvements in efficiencies that translate into ongoing improvements in the emissions of fuel driven equipment.

The handling, washing and drying of coal at coal preparation plants and the transport of coal to mine-mouth generating stations or to export markets present possibilities for the generation of coal dust. Historical coal drying and loading operations were routinely associated with dust that was once an accepted part of coal development in mining communities. Modern coal facilities are evolving into enclosed structures that limit external release of coal dust. Open stockpiles of coal are minimized or, where necessary, coated with water or dust retardants. Similarly, train cars loaded with coal are sprayed with latex to limit the loss of coal or production of dust. Coal mine facility sites are licensed under The Clean Air Act which requires regular monitoring and reporting of air quality.

Coal-fired generating stations produce emissions of fly ash, sulphur dioxide, oxides of nitrogen, carbon dioxide and water vapour. As indicated in the submission of the Electric Utility Planning Council to the CASA, electrical utilities have made major strides in reducing emissions from coal-fired power plants to meet provincial and federal standards.

The coal producing members of the CAC share the air quality concerns and issues that confront its electrical utility customers that rely on the combustion of coal to meet the Province's electrical needs. One issue, in particular, that has been receiving the attention of the popular press is the presumed relationship between carbon dioxide and climate change or global warming. *The issue of global warming is one example of where public policy and air quality standards have the potential to be influenced by a relationship that remains to be scientifically substantiated. The CAC urges the CASA to evaluate critically the air quality issues and the environmental and economic implications of any policy formulated in the absence of scientific consensus.* The Alberta Acid Deposition Research Program (AADRP) is an example of research that provides a basis for arriving at a rational strategy for one aspect of air quality management in Alberta.

The following portions of this brief highlight the CAC's view of current air quality issues and recommended approaches to a Clean Air Strategy. The coal industry has consistently demonstrated that its technology can be brought into line with environmental requirements as defined through public, government and industry consensus and scientific information. Examples of this include The Land Surface Conservation Act and the present Environmental Impact Assessment Guidelines which were formulated initially using the coal industry as a test case. The coal industry participated in the development of reclamation technology and set the standard for environmental impact assessment in Alberta. The coal industry continues to cooperate in the process of regulatory reform, through the establishment of the Coal Coordinating Committee by Alberta Environment and the Energy Resources Conservation Board. We trust that this same spirit of consultation and consensus will prevail in the formulation of the CASA.

ISSUE RESOLUTION

The CAC is committed to environmental protection. The coal industry recognizes that commitment requires action, including research and cooperative efforts with government.

Research

Coal industry involvement in joint research programs with government, such as the Mountain-Foothills Reclamation Research Program (MFRRP) and the Plains Coal Reclamation Research Program (PCRRP), provide examples of how industry and government can respond to environmental uncertainties. In the early 1970s, the depth of subsoil replacement on reclaimed plains coal mining areas proved to be a contentious issue. At the time, a prevailing opinion by some regulators favoured the requirement for a substantially deeper subsoil replacement depth than what industry thought was reasonable. This situation was not unlike that of the global warming controversy in which a reasoned opinion is that environmental controls should err on the side of caution.

The issue of subsoil depth was resolved through the establishment of PCRRP. Both regulators and industry accepted the findings of the Program, which resulted in the subsoil requirement being revised downwards substantially. Coal mine reclamation now achieves a standard of land capability at least comparable to that existing before mining. The revision of the subsoil requirement, based on sound information, lowered the costs of mining and reclamation which are ultimately borne by the citizens of Alberta.

Land use issues in the past were resolved through joint government-industry cooperation in reclamation research which provided the basis for practical reclamation technology founded on sound scientific information. Similarly, several air quality issues face the coal industry, some founded on uncertain scientific information. We suggest, therefore, that the same approach should be applied to the resolution of air quality issues.

The CAC recognizes that commitment to air quality must be supported by action in areas where there are concerns. Most recently, members of the CAC have initiated the development of an Advanced Integrated Gasification Combined Cycle (AIGCC) demonstration project. This project includes the participation of the federal and western provincial governments. The demonstration plant will combine coal gasification with gas and steam turbines to produce the cleanest, coal based electricity possible. AIGCC has the potential to provide carbon dioxide recovery, 99% removal of sulphur, 75% reduction in NOx emissions, increased efficiency and related benefits such as reduced requirements for land and water. *The CAC looks to AIGCC as a commitment to the future to develop new technologies that will enhance our capability to respond to new environmental challenges.*

Consensus

The definition and establishment of meaningful environmental standards can be achieved through commitment to environmental protection by both government and industry. Until recently, water quality standards specified in Clean Water Act licences issued to coal mines in the mountain and foothills region of Alberta presented problems for both regulators and mine operators in terms of achieving compliance. Both parties formed a committee to formulate meaningful discharge standards for water control structures at minesites. The criteria for new water quality standards included satisfying the conditions of being biologically meaningful, scientifically based and technically achievable. In part, this process drew on the results of a hydrological study commissioned through MFRRP. To date, a draft licence has been formulated with preliminary agreement by all parties. *The CAC looks forward to continuing its cooperative approach with government in developing meaningful and scientifically-based air quality standards.*

National and International Perspectives

The CAC urges coordination with national policy making in the area of air quality. Initiatives such as the Federal NOx/VOC Management Plan and the setting of carbon dioxide targets must be supported by international agreements. Canada and Alberta run the risk of developing air quality strategies that have little global impact, yet place its industries at an economic disadvantage. Developing countries will continue to rely on coal for the generation of electricity using coal combustion technology considerably less efficient than that of Canada's and on a scale of two orders of magnitude higher in terms of tonnage of coal burned.

In terms of relative impact, Canada and Alberta can achieve greater impact through the transfer of clean coal technology and international agreement than through unilateral action only. The CAC is willing to commit manpower to such technology transfer; coordination remains to be provided by the Federal and Provincial governments in this respect. *Unilateral federal action unsupported by a coordinated provincial strategies will only act to prejudice Alberta's ability to grow on its strengths; that is, its natural resources such as coal.*

RECOMMENDATIONS

The CAC considers the CASA to be a positive and important initiative. We therefore offer the following suggestions that reflect our expectations of the CASA.

Clear Definitions of Issues

An effective air quality strategy for Alberta must be founded on clear definitions of issues. In the absence of consensus amongst the scientific community, actions directed toward taking appropriate measures must be justifiable. *Action on issues such as global warming must be supported by scientific information collected and analyzed by independent scientists.*

Environmental and Economic Implications

The Clean Air Strategy was established to "outline practical and achievable actions that can be taken ... to reduce emissions". The opportunity for managing air emissions will not fully realized until the government sets clear objectives and targets based upon the opinions and technical expertise of all stakeholders in Alberta.

These targets must be set with a thorough understanding of the environmental and economic implications to this province. The support required from the public and industry to specific objectives and targets will only come when we have an analysis of the incentives and costs associated with the management of emissions.

Constructive Solutions

The CASA should address those areas of Alberta where significant air quality problems are known to occur. The Alberta Acid Deposition Research Program report indicated that acid gases are not, in general, harming the Alberta environment, although some areas of the province could be susceptible to acid deposition. This suggests that the mechanism of applying sulphur dioxide/NOx caps should anticipate zone limits for such emissions, not necessarily province-wide limits. *The CASA should incorporate flexible regional solutions depending on the capacity of the environment to assimilate emissions.*

International and national air quality initiatives and protocols will clearly influence our decisions in Alberta. The CASA initiatives directed only at the management of industrial air emissions within Alberta are likely to have little relative impact on global air quality. Nevertheless, such initiatives cannot fail to appreciate the global context; the CASA must therefore assess how it can exert influence on those jurisdictions and countries that are less circumspect about air quality. One possibility suggested by the CAC is technology transfer.

The Alberta effort on air quality should be supported by the federal government to ensure that the CASA initiatives are not undertaken in isolation in the global context. *Similarly, the government of Alberta should ensure that federal initiatives seeking global agreement on air quality are based on sound scientific information and reflect regional environmental and economic priorities within Canada.*

Partnerships with all Stakeholders

The CAC urges the Alberta government to strengthen ties between the province and the federal government in identifying common goals, defining the issues, and developing solutions and actions where warranted. The CAC is concerned that the CASA may overlap with federal initiatives, which could result in unnecessary regulatory duplication or uncertainty as in the case of the present environmental assessment review controversy. *We therefore urge the Alberta government to take the lead role and seek harmony between provincial and federal air quality regulations.*

The CAC recommends that the CASA build on the working relationships that CAC has developed with Alberta Environment in the matters of regulatory reform, reclamation approaches, and water quality standards, as highlighted earlier in this submission. *The CAC is committed to the development of enlightened environmental policy and legislation based on scientifically defendable information and consensus with all stakeholders.*

Regulatory Framework

The current regulatory framework for air quality management in Alberta rests with the provincial Clean Air Act. We endorse the retention of this Act within the broad enabling legislation of the proposed Environmental Protection and Enhancement Act.

The setting of emission targets can be very costly and inefficient without the flexibility for the operator to choose the appropriate technological and economical tools. *The CAC favours the use of decentralized approaches to implement new targets and standards;* in our view, market based instruments such as tradeable permits and tax incentives will be more efficient than command and control strategies. *The regulatory framework for the CASA should promote a flexible approach.*

CLOSING

The coal industry has direct interest in the Clean Air Strategy for Alberta. The CAC is committed to contributing to a meaningful and efficient CASA and recognizes that commitment to air quality must be supported by action. We look forward to continuing our cooperative approach with the provincial government in the interests of achieving a sustainable environment and economy.

CANADIAN COAL INDUSTRY'S POSITION ON ATMOSPHERIC CHANGE AND POTENTIAL GLOBAL WARMING

The constitution of The Coal Association of Canada, written in 1973, specifically cites "environmental concerns" as an area towards which the Association is to direct its attention and efforts. In the intervening years the Canadian coal industry has demonstrated its concern for the environment, its ability to mitigate impacts and to operate within publicly acceptable environmental guidelines. Efforts have focused on issues of water quality and use, land use, air quality, industrial health and reclamation.

Today, the coal industry has a heightened concern for the environment due in particular to the issues of potential global warming and climate change. The growing level of public concern with these issues is creating pressure on politicians to provide leadership and guidance to the country.

As an important contributor to Canada's energy needs, the coal industry needs to share with the public and governments factual information relevant to our industry and its role as a source of energy. We do not have final answers to all of the questions but we can contribute to improving the understanding of the role of our industry and hence improve the quality of decisions Canadians make.

Furthermore, the Canadian coal industry is itself committed to take specific actions directed at important environmental concerns. These actions will fall generally into the categories of science and technology, education, and policy making.

Technology

The Canadian coal industry will:

1. Continue to improve its own efficiencies to reduce emissions and to consume less energy in the production and use of coal, a continuation of the behaviour referred to earlier.

2. Continue applied research and development to achieve further efficiency gains in the production, transportation and use of coal.

3. Examine and adopt where practical, the alternative options of reducing vehicle and equipment emissions through higher efficiency gains by electrification and fuel substitution.

4. Promote the use of higher quality coals and more efficient coal combustion technologies in developing countries and Eastern Europe.

5. Invest in the development and deployment of high quality, low impact coal combustion and processing technologies. An example is the joint industry/government feasibility study of integrated gasification combined cycle power generation technology to reduce emissions and increase efficiencies.

6. Seek further applications for waste heat recovery and use (for example district heating, greenhouses, fish farming, etc.), and strive to find economic uses for all by-products of the coal cycle.

7. Seek applications for higher efficiency energy use from coal by promoting cogeneration projects; e.g., to produce steam for electrical power generation and other industrial applications including district heating.

8. Promote purchasing of energy efficient production equipment by the coal industry.

9. Develop measurements of coal industry emissions and monitor the performance of the industry on a regular basis.

Communication and Education

1. As a major segment of the Canadian economy both domestically and through exports, the coal industry will act to inform the public and the policy decision makers of the social and economic effects of potential environmental policy and regulatory decisions on our industry and participate in the ongoing consultation process among government, industry, labour and Non Government Organizations.

2. The Coal Association of Canada will launch a major information campaign designed to update and inform decision makers and educators on the role of coal in the energy mix. In the process the Association will adopt strategies to more effectively communicate to these and other stakeholders.

3. The Coal Association of Canada will establish an external advisory panel to the Association on environmental issues.

4. The Coal Association of Canada will provide data and personnel to assist the federal government in promoting Canadian technology abroad to reduce the global impacts of coal use.

5. Encourage government to include industry and Non Government Organizations in the negotiation of international treaties and make competent coal industry personnel available.

Science

The coal industry agrees that the potential impacts of significant climate change require that response actions be taken. Given the considerable level of uncertainty with respect to timing, magnitude and global distribution of possible change, these response actions must be environmentally and economically responsible. The coal industry believes that much can be done to moderate emissions through energy conservation measures and improvements in efficiencies in energy supply.

Policy Making - Recommendations to Governments

The government's goal is "to make Canada the industrial world's most environmentally friendly country" which we assume to mean providing leadership in achieving sustainable development. Leadership may be established by aggressively seeking to understand the implications of atmospheric change, by promoting efficiency and conservation, and by carefully reasoned decision making which integrates economics and environmental issues on the basis of practical established priorities. Canada can continue to show leadership in demonstrating an ability to develop effective processes for achieving nation-wide consensus on actions to be taken to protect the environment.

As an example, the industry recommends that before entering into any international agreements Canada ensures that it has the backing of stakeholders within Canada. We recommend the involvement of representatives of appropriate Canadian industries, labour and Non Government Organizations in ongoing international negotiations. As a country highly dependant on its international competitiveness, Canada would be wrong to sacrifice that competitiveness without a full and ongoing consultation with the affected parties.

In a similar vein, the coal industry believes that international agreements will only be as effective as the strength of each country's domestic commitment. If Canada is to demonstrate true leadership the federal government must have the backing of all environmental stakeholders. Thus, we recommend that future policies and strategies for environmental control should be developed not only on the basis of full consultation but with stakeholder consensus.

The industry strongly recommends accelerated research and technology development to improve scientific understanding of the environment and any changes that are occurring. Funding and manpower for research and development at the federal level should therefore be focused on global environmental issues.

Coal represents approximately 71% of the fossil fuel resources in Canada and a similar percentage on a worldwide basis. In view of the abundance of this resource, the coal industry recommends that Canada focus significant research on development, deployment and export of the best possible economic coal combustion technology.

The industry recommends seeking international consensus for resolving global environmental problems on the basis of specific national needs. In this way, nations such as Canada could concentrate their economic and technological resources in those areas where they can have the greatest possible impact on the global environment. We believe that solving local problems is the most cost effective solution to improving Canada's overall environmental performance.

It is crucial to this country that Canada maintain its economic strength. Actions that weaken the Canadian economy and render it uncompetitive internationally will leave us poorly equipped to address global and national environmental challenges. The industry recommends that the federal government introduce environmental policies that reward innovation, and provide Canadian industry with the economic flexibility to seek lasting technological solutions to environmental problems. The federal and provincial governments should not be competing with each other regarding stringency of standards. Rather, the focus of their efforts should be to ensure that the appropriate standards are properly applied at the regional level, and that the federal and provincial governments work effectively together in their application.

We support further refinement of industry's environmental responsibilities in priority areas such as land reclamation, air and water quality, and wildlife protection. At the same time, we call for a clear process of legislation with appropriate stake holder input and clear governmental jurisdictions.

Governments should support the efforts of coal burning electric utilities to adopt energy conservation measures such as cogeneration, demand side management, and district heating.

It is a prerequisite that any examination of radiative gases should take into account all greenhouse gases and their full fuel cycles, because if only burner tip emissions of carbon dioxide are considered, the predicted results of mitigative measures could be seriously incorrect and overstated.

Finally, it is important to emphasize that the ultimate world reserves of hydrocarbons are finite and this is particularly so for the more economic sources of oil and gas. Our energy policies should ensure that these limited resources be consumed in the most appropriate applications and as efficiently as possible. This approach will ensure that we attain the goal of sustainable development as well as achieve our objectives of reducing greenhouse gas emissions.

Summary

The Canadian coal industry has for years demonstrated its commitment to environmental responsibility. The industry has a program of activities designed to continue our responsibility. At the same time, we believe that a cooperative, consultative approach by industry, government, labour and Non Government Organizations will yield the best possible results. We urge the governments of Canada to show leadership in this important area and we offer our cooperation.

October 1, 1990

CANADIAN PETROLEUM ASSOCIATION
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Telephone (403) 269-6721
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February 6, 1991

Mr. Norm MacMurchy
Assistant Deputy Minister
Alberta Department of Energy
10th Floor
9945 - 108th Street
Edmonton, Alberta
T5K 2C9

Dear Mr. MacMurchy:

RE: CPA SUBMISSION TO CASA

Please find enclosed the Canadian Petroleum Association's (CPA) submission to the Clean Air Strategy for Alberta (CASA). This document represents the collective views of our member companies and presents a number of recommendations for improving the management of Air Quality in Alberta.

CPA members have a significant interest in CASA because they represent some of Canada's largest upstream petroleum producers. As such these members are also responsible for producing many of the emissions currently being reviewed by CASA. We are, therefore, keenly interested in the development and implementation of strategies to more effectively manage air quality in Alberta.

I trust that you will find the recommendations made in this document to be useful in preparing for the CASA Summary Workshop to be held in early June, 1991. CPA plans to take an active role in this workshop and would like to participate fully in the ongoing management of air quality issues that result from this meeting.

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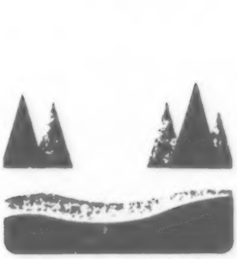
If you should have any questions with respect to this submission, please contact Mr. Doug Bruchet of my staff.

Yours sincerely,

Ian R. Smyth
President

CANADIAN
PETROLEUM
ASSOCIATION



CANADIAN PETROLEUM ASSOCIATION

SUBMISSION FOR THE CLEAN AIR STRATEGY FOR ALBERTA

February 8, 1991

PREFACE

The Canadian Petroleum Association submits this document to the Government of Alberta as part of the consultation process of the Clean Air Strategy for Alberta (CASA), a project jointly sponsored and managed by Alberta Energy and Alberta Environment. This document outlines the CPA's views and recommendations for improving management of air quality in Alberta.

CASA was initiated in early 1990 by Alberta's Ministers of Energy and Environment. It is aimed at encouraging public discussion on gaseous emissions that contribute to acid deposition, ozone depletion, ground-level ozone (smog) and the greenhouse effect. The objectives of CASA are:

- to help identify and clarify the issues associated with energy use and production that are most important in developing a clean air strategy
- to outline practical and achievable actions that can be taken by consumers and producers to reduce emissions
- to develop policy and program recommendations to present to the provincial government

The strategy allows for input at four stages from groups, individuals and industries that have specialized knowledge or interests in air quality issues.

CPA members are keenly interested in providing input to CASA. As some of Canada's largest upstream petroleum producers, CPA members are responsible for producing a large proportion of the emissions currently being reviewed by CASA. Association members produce approximately 80 percent of Canada's crude oil and 70 percent of its natural gas, and they conduct over 90 percent of the country's pipeline transportation of petroleum products.

PREFACE
(cont'd)

The CPA is confident the recommendations in this document will contribute significantly to the search for methods to improve current and future air quality. The association is also confident its recommendations will be assessed in detail by Alberta Energy and Alberta Environment and encourages them to contact the association for further clarification of any points.

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INTRODUCTION

This report presents the CPA's recommendations for improving air quality management in Alberta. The recommendations focus on the need to set priorities and objectives for air quality improvements and to apply effective processes to achieve these objectives. The recommendations also emphasize long-term solutions because the CPA strongly believes any plans established during the current CASA consultations, must be adaptable to meet changing needs of the future.

The CPA provides its recommendations in the form of specific action plans. The association believes this will help government and industry move quickly toward establishing effective methods of decision-making and administering air quality improvements. The consultation process is an excellent forum for establishing criteria to assess the severity of air quality problems, develop programs to suit each problem, set deadlines and assign responsibilities.

Background to CPA Recommendations

The recommendations reflect a number of CPA beliefs regarding environmental protection. These beliefs, which have resulted from member companies' involvement in numerous environmental projects, are listed below:

- environmental protection goals and measures must be well-defined and based on sound scientific information
- protection measures must be responsive to technological advancements and changes in public perceptions and attitudes
- measures must be cost-effective, addressing highest priorities first to ensure best use of limited resources

Background to CPA Recommendations

- the best available scientific knowledge must be used at all times to make decisions
- all stakeholders must participate in defining problems and measures for improvements
- governments must use regulatory approaches that are most appropriate for ensuring environmental protection. Market-based incentives to encourage activities that reduce emissions should be assessed.
- air management strategies cannot be unilateral because some problems are the result of emissions from outside Alberta
- federal and provincial legislation and policies must complement each other to avoid regulatory confusion and unnecessary costs

The CPA recently stated these beliefs in the Issues and Options Workshop in Phase One of CASA. Many other industries, groups and individuals at the workshop held the same views. The CPA has also stated these points in other documents presented to governments: the CPA's response to Environment Canada's "Framework for Discussion on the Environment" and the CPA's response to Alberta Environment's Discussion Draft of the Proposed Alberta Environmental Protection and Enhancement Legislation.

The belief that all stakeholders should be involved in decision-making is clearly conveyed in the CPA's recommendations. The CPA recommends stakeholders be involved in the development of criteria for making decisions on air quality management and for implementing these decisions. This approach will eliminate concern about how the government assesses and uses stakeholder input during consultation. After stakeholders have had input

Background to CPA Recommendations (cont'd)

into this framework for air quality management, government can administer the program.

CPA's Environmental Program

The CPA's recommendations for air quality management stem from its long-standing involvement in environmental projects. Over many years, the association has supported research programs, prepared an environmental code of practice and guidelines for its members, and participated in cooperative projects with governments. CPA members have also consistently met or bettered government-regulated emission levels for oil industry operations.

A comprehensive description of the CPA's environmental program, including future activities, is in Appendix A. The CPA's Environmental Code of Practice, developed in 1988, is presented in Appendix B.

RECOMMENDATIONS

The CPA presents seven specific recommendations that form an action plan for improving air quality management in Alberta. The first three recommendations provide methods for defining objectives for air quality management in Alberta; the next four recommendations provide the processes for attaining those objectives.

The recommendations are as follows:

1. Define Air Quality Issues
2. Set Priorities for Issues
3. Establish Objectives and Targets
4. Adopt a Zone-Targeted Approach to Air Quality Management
5. Use Appropriate Regulatory Instruments
6. Provide Effective Consultative Decision-Making
7. Coordinate Air Quality Research and Data Management

1. Define Air Quality Issues

Identify Current and Future Air Quality Issues

The first step to setting air quality management objectives for Alberta should be to have the stakeholders clearly identify current and future air quality issues and the nature and severity of their environmental impacts. In doing this, only the best available knowledge must be used. As discussed in the Issues and Options Workshop, the best available

1. Define Air Quality Issues (cont'd)

Identify Current and Future Air Quality Issues (cont'd)

information should be obtained from all sources, including government, industry, universities, researchers and other stakeholders. The Acid Deposition Research Program (ADRP), a recently released study on the environmental effects of sulphur dioxide emissions, is a very useful reference as are the long-term biomonitoring studies conducted by the Northern Forest Research Centre near sour gas plants in West Central Alberta.

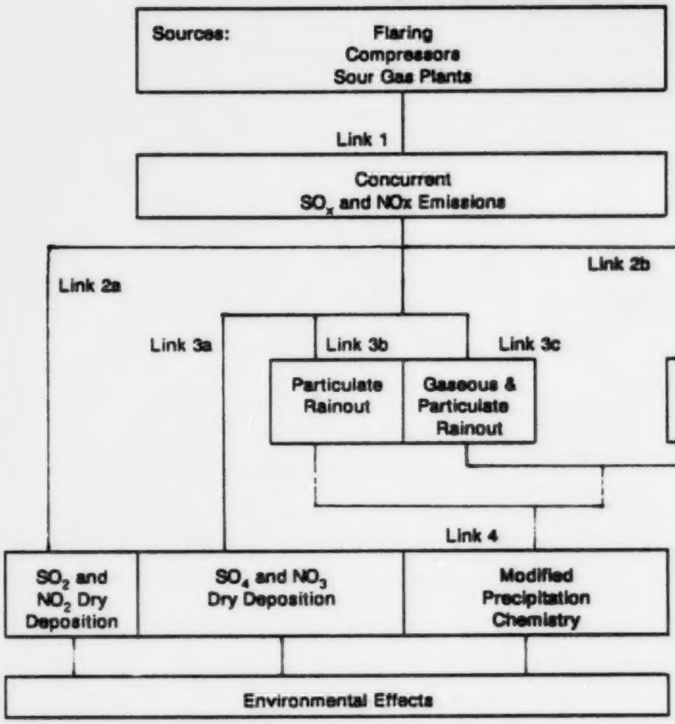
Define All Aspects of Air Quality Issues

In defining an air quality issue, stakeholders should:

- describe emission types, amounts and dispersion characteristics (i.e., zones of potential impact)
- assess ecological fates and effects of emissions (Figure 1 shows an example of how fates and effects could be analyzed.)
- assess the probability and significance of the effects of emissions on health, socio-economics and the biophysical environment
- analyze trends in factors that affect air quality, such as those listed below, to enable prediction of air quality in the future:
  - population
  - climatology
  - energy production and use
  - economic development activity

  Trends should be examined on an international, national, regional and local basis.

CAUSE AND EFFECT ANALYSIS OF ACID DEPOSITION


Sources:
Flaring
Compressors
Sour Gas Plants
Link 1
Concurrent SO_x and NOx Emissions
Link 2a
Link 2b
Link 3a
Link 3b
Link 3c
Particulate Rainout
Gaseous & Particulate Rainout
SO_2 and NO_2 Rainout
Link 4
SO_2 and NO_2 Dry Deposition
SO_4 and NO_3 Dry Deposition
Modified Precipitation Chemistry
Environmental Effects

Linkages

1. Point source emissions from the Project A, Project B and other provincial/extra-provincial sources will result in concurrent SO_x and NOx emissions.

2a. Gaseous SO_2 and NO_2 emissions will be directly absorbed (dry deposition) by surface features. The degree of absorption will depend on atmospheric stability and the surface characteristics of the receiving substance.

2b. Gaseous SO_2 and NO_2 emissions will be removed by rainout processes.

3a. Particulate SO_4 and NO_3 forms will be absorbed (dry deposition) by surface features, depending on atmospheric stability and the surface characteristics of the receiving substance.

3b. Particulate compounds will be entrained in the cloud formation process and act as condensation nuclei (rainout).

3c. Interception of the emission plumes by precipitation can result in the removal (washout) of gaseous and particulate compounds.

4. Precipitation chemistry will be modified as a result of particulate rainout, gaseous and particulate washout, and SO_2 and NO_2 rainout.

Source: Modified from OSLO Project Draft Environmental Impact Assessment Summary Report from Workshop II: Development and Validation of Impact Hypotheses.

FIGURE 1

2. Set Priorities for Issues

Optimize Use of Limited Resources (cont'd)

After the stakeholders have identified air quality issues, they must set priorities for the issues to ensure limited resources (human, financial, institutional and natural resources) are used most effectively.

Stakeholders must be involved in this ranking of air quality issues. This is because they will be affected by corrective measures and therefore should participate in determining what issues are most important.

Make Priority Setting an Objective and Ongoing

The CPA also recommends stakeholders set priorities for issues objectively, using pre-determined criteria and best available scientific information. Criteria should relate to:

- human health
- biophysical impacts
- economic impacts
- urgency

Priorities should be constantly evaluated using the best available knowledge at the time, to ensure the ranking is still pertinent.

3. Establish Objectives and Targets

Assess Costs and Benefits of Various Target Emission Levels

After stakeholders have objectively set priorities for air quality concerns, they should determine acceptable and practical target emission levels for the emissions of concern. To do this, various levels should be evaluated for their:

- environmental effects
- effects on human health
- costs

Through this objective assessment stakeholders can select emission levels that result in the optimum balance between costs and benefits.

The target emission levels should be focused on current or potential air quality problems.

The CPA recommends the use of tools such as a scenario matrix, as shown in Figure 2, for determining optimum target emission levels. The scenario matrix shows:

- the various target levels applied to zones of potential impact
- regulatory or technological options for restricting emissions to those levels
- ambient concentrations, deposition levels or both that result from various target emissions
- the effects of target emission levels on the environment and socio-economics

EMISSION SCENARIO MATRIX

Emission	Year	Current or Future Emission Level (t/d)	Target Emission Level (t/d)	Regulatory or Technological Control Options	Ambient Conc. and/or Deposition Levels	Impacts		Costs
						Environmental	Socio-economic	
SO_2	1990							
	1995							
	2000							
NO_x	1990							
	1995							
	2000							
CO_2	1990							
	1995							
	2000							
VOCs	1990							
	1995							
	2000							

FIGURE 2

3. Establish Objectives and Targets (cont'd)

Assess Costs and Benefits of Various Target Emission Levels (cont'd)

- the costs of restricting emissions to those levels

Risks associated with uncertainty will also have to be added to this information when decisions are being made.

In addition to providing an objective analysis of air pollutants, the scenario matrix has the following benefits:

- it shows how changes in emissions of one gas affect the emissions of others
- it shows gaps in information
- it demonstrates the need to set priorities for actions because of the broad implications of changes

This scenario matrix is different from methods used currently, which focus mainly on emission rates rather than effects of total emission levels from all sources on the environment and socio-economics.

4. Adopt a Zone-Targeted Approach to Air Quality Management

Ensure Government Regulatory Structure Focuses on Problem Areas

The CPA recommends stakeholders and government establish air quality management zones which spatially define pollutant-specific air quality problems (current or potential). Zone-targeted total emission levels would be set for each pollutant of concern.

4. Adopt a Zone-Targeted Approach to Air Quality Management (cont'd)

Ensure Government Regulatory Structure Focuses on Problem Areas (cont'd)

The levels of total emissions for the zones would be determined using the best available knowledge of the problem, as generated in the previously described scenario matrix.

Use Objective Criteria for Establishing Zones

The zones with their associated target emission levels would be based on the following information, and could be deleted or amended in response to new information:

- emission sources and volumes
- emission dispersion characteristics
- fates and ecological impacts of emissions
- risks and probabilities of all related events

Benefits of Zones

The CPA supports the use of air quality management zones because they can be designed to address differences in real or potential air quality problems. For example, zones could be established around urban centres where NOx and VOCs emissions (urban smog) might be a concern, or in an area where SO_2 is a concern because the soil or surface water is particularly sensitive to acid deposition. In some parts of the province, present air quality is not a concern and zones with further emission reductions are not required.

4. Adopt a Zone-Targeted Approach to Air Quality Management
(cont'd)

Benefits of Zones
(cont'd)

The zone concept ideally would not have to recognize provincial, federal or even international boundaries, making air quality management even more effective.

The zone concept also provides flexibility in responding to problems because different approaches to controlling emissions can be implemented in different zones.

5. Use Appropriate Regulatory Instruments

Consider a Combination of Regulatory Approaches

The CPA recommends the government use an innovative and flexible approach to air quality regulation. Controls could include a number of different methods: economic incentives and market-based mechanisms (i.e., permit trading), as well as the traditional command and control approach (i.e., specifying maximum allowable point source emissions for specific activities). Market-based controls to air pollution promote reductions in pollutant emissions by changing the business factors that affect decision-making within industry.

More information on market-based approaches will soon be available in the discussion paper "Market-based Approaches to Managing Air Emissions in Alberta". This work is funded by the CPA, Alberta Energy and Alberta Environment.

5. Use Appropriate Regulatory Instruments (cont'd)

Consider a Combination of Regulatory Approaches (cont'd)

The association offers to work with government to:

- identify and assess alternative approaches to controlling air pollutant emissions
- better integrate economic and environmental considerations into decision-making

6. Provide Effective Consultative Decision-Making

Obtain Stakeholder Input Over the Long Term

Throughout this report, the CPA has recommended stakeholders have input into all key decisions regarding air quality management. To ensure this happens throughout the consultation process and into the future, the CPA urges the government establish an effective way of regularly gathering input and making joint decisions.

Stakeholders should continue to be involved in defining:

- emission objectives
- desired emission targets for air pollutants
- air quality management zones
- appropriate methods for reducing emissions (e.g., regulatory instruments, monitoring requirements, etc.)
- appropriate time frames for change

6. Provide Effective Consultative Decision-Making (cont'd)

Obtain Stakeholder Input Over the Long Term (cont'd)

Stakeholders should also have input into the coordination of air quality management efforts with other provinces and countries. As air quality management problems extend beyond the province, other provinces and countries will have to be consulted.

The CPA believes stakeholder input is mandatory for two very important reasons:

- to bring to the process the benefits of stakeholders' diverse knowledge and experience
- to ensure stakeholder commitment to actions taken to manage air quality

The CPA also recommends government focus its efforts on obtaining stakeholder input on the criteria and processes for managing air quality. Once consensus has been reached on these basics, stakeholders can implement the decisions within their own operations and Alberta Environment can administer the program.

The CPA recommends government involve representatives from the public, industry and government (e.g., Energy Resources Conservation Board or Alberta Energy) in the air quality management program. This will enable consideration of economic and environmental aspects of air quality management. Economic analyses must be part of decision making.

7. Coordinate Air Quality Data Management and Research

Improve Use of Air Monitoring and Research Information

The CPA recommends the government coordinate the current efforts of air quality data management, analysis, assessment and research. At present, most air quality information is spread among a number of groups and is not being effectively used to improve air quality management. Also, little use is being made of the substantial air quality information gathered during industry monitoring.

The coordinated effort needs to produce the following results:

- new, more efficient methods of testing and monitoring air quality
- coordinated research projects
- a comprehensive information management system that includes the extensive monitoring information currently being collected, is cost-effective, and enables assessment of current and emerging regional, inter-regional and global air quality issues.

The CPA feels strongly that monitoring information must be included in the data management system to make data more useful. Currently, the primary use of monitoring information is to determine regulatory compliance. Monitoring information can be used to a much greater extent to:

- assess provincial air quality
- provide timely feedback to key stakeholders to allow them to assess progress toward meeting established goals and to assist them in making decisions

7. Coordinate Air Quality Data Management and Research
(cont'd)

Improve Use of Air Monitoring and Research Information
(cont'd)

- make improvements in air quality monitoring capability
- support scientific research on key air quality issues
- develop improved dispersion models for assessment of facilities and projects
- ensure cost-effective use of resources by all stakeholders

CPA Commitment to Recommendations

The CPA's seven recommendations provide an ongoing process that will enable objective and effective management of air quality. The CPA is committed to working closely with government in using these recommendations as well as input from others involved in the CASA consultation process, to improve air quality management in Alberta.

APPENDICES

Appendix A: Summary of CPA's Environmental Program

Environmental Activities Within CPA

The CPA has a long history of environmental work. In the early 1970s the CPA started a number of the initiatives that continue to lead the way to sustainable development, not only within the upstream petroleum industry but also within other Canadian industries. The association created an environmental standing committee, and also positioned the industry to reduce accidental oil spills and better manage its containment and recovery. In 1973 the CPA also joined, as a charter member, the provincial environment minister's Alberta Petroleum Industry/Government Environmental Committee, established in 1973.

The association's environmental efforts were largely spill-related throughout the 1970s, and its initial environmental research project had oil and brine spills as its focus. The CPA is now involved in an ever-broadening variety of environmental work.

Environmental Code of Practice

In 1988 the CPA adopted an environmental code of practice for the industry. The code encourages member companies to strive for high environmental performance standards. To supplement the code, the association updated its Environmental Operating Guidelines and prepared guidelines for environmental audits and public consultation.

Operations

The CPA's Environmental Operating Guidelines for the Petroleum Industry are a compendium of legal, regulatory and technical requirements for environmentally sound oilfield practices. The 1980 publication was updated with major modifications in 1988, and it has played a large part in the broad integration of environmental management into all types of upstream petroleum industry operations.

Research

Since 1970, research projects with a total value of about $300 million have been conducted by CPA members, many through joint programs with other associations, governments, universities and countries.

The CPA presently supports a variety of research initiatives, one of which is the Task Force on Oil Spill Preparedness, committed to spending $5.5 million on research over five years. Another CPA research activity is Environmental Studies Research Funds (ESRF), which is funded entirely by petroleum company contributions (at about $1 million per year) and managed jointly with government.

In addition to funding research, CPA members provide advice to several externally funded research groups, including government groups. A notable example is the Panel on Energy Research and Development (PERD), which includes energy-related environmental research in its mandate. CPA representatives are members of several PERD technical committees and provide input on upstream petroleum industry priorities and research needs.

The CPA also has an environmental research committee with a mandate to coordinate and advise on environmental research issues, priorities and external relations.

Past environmental research initiatives by the CPA include the CPA Environmental Research Advisory Council, formed in the mid-1970s, and the Acid Deposition Research Program (ADRP). The Canadian Offshore Oilspill Research Association (COOSRA) was initiated in 1980 and funded (at approximately $1 million per year) by members of the upstream petroleum industry involved in frontier offshore exploration. A number of studies under the COOSRA program were conducted jointly with the upstream petroleum industry and governments. The

Appendix A: Summary of CPA's Environmental Program (cont'd)

Research (cont'd)

largest project involving COOSRA was the Baffin Island Oilspill Study, a 4-year, $7 million study conducted on Baffin Island. Governments and private industry in both Canada and the U.S. were involved, as well as the government of Norway.

Waste Management

In 1983, the CPA released waste disposal guidelines for the petroleum industry and fostered their implementation through industry-wide seminars. The association commissioned research studies on the disposal of oily wastes through land farming, and on the reclamation of land affected by spills. The CPA also successfully developed a special incinerator for oilspill wastes.

The CPA, through its Waste Management Subcommittee, is currently revising its Waste Management Guidelines to help the upstream petroleum industry improve reduction, recycling, treatment and disposal of oil and gas wastes. The Guidelines will include details on the Workplace Hazardous Materials Information System, Transportation of Dangerous Goods Regulations, and quantitative evaluations of numerous wastes and hazardous substances.

Work Environment

Hazardous materials management in the workplace received special attention in 1988. In that year the CPA created a training package for oilfield workers and generic labels for hazardous materials.

Sulphur Handling

The CPA's Sulphur Handling Guidelines illustrate ways to handle sulphur safely, with minimal risk to the environment. They were first published in 1981, and updated in 1983.

Appendix A: Summary of CPA's Environmental Program (cont'd)

ADRP	In 1983 the CPA made a major financial commitment to a baseline study of the impact of SO_2 (sulphur dioxide) emissions and other air pollutants. The ADRP investigated the biophysical and medical effects of air emissions in Alberta. It received acclaim from scientists and scientific organizations around the world. The research teams issued their final reports in 1988.
Frontier Development	Since the early 1970s, the CPA has organized and sponsored annual conferences on environmental and socio-economic issues in the frontier regions. These conferences are in addition to the ESRF, established in 1983. During the 1980s, ESRF published 105 specialized research studies on frontier-related environmental subjects.
Public Information Activities	The association believes in public participation and consultation. The ADRP, for example, used one of the most elaborate public involvement programs ever incorporated in a major scientific research program. And one of the key provisions of the Environmental Code of Practice is that oil and gas companies acknowledge the legitimacy of people's right to know about the particulars of projects that will affect them or their environment. In keeping with that, the CPA has also developed Public Consultation Guidelines, which are finding use beyond the oil and gas industry.
Global Climate Change	In 1989, the CPA chose to improve its understanding of global climate change. An Air Issues Task Force commissioned an independent scientific review of the Intergovernmental Panel on Climate Change working-group reports. The task force is currently studying air emissions released by the industry (CO_2, NOx, CH4 and VOCs).

Appendix A: Summary of CPA's Environmental Program (cont'd)

Economic Instruments	CPA, Alberta Energy and Alberta Environment have recently commissioned a study to evaluate the feasibility of using economic instruments (e.g., permit trading, taxes, surcharges) to control pollution. The CPA will continue to advise government of its findings in this area.
Policy Statement	Companies are committed to protecting the environment and to maintaining public health and safety during all phases of operation of the petroleum industry. They do so on behalf of their shareholders and employees, and on behalf of present and future generations of Canadians.
Society Environment and Energy Development Studies Foundation	The CPA contributes funding and time to the Society Environment and Energy Development Studies Foundation (SEEDS) program. The mandate of this foundation is to prepare teachers to instruct all grade levels in energy and environmental issues and to create learning modules for students. SEEDS is governed by a board with equal representation from industry, education an the social/environmental sciences.

Appendix B: Environmental Code of Practice

Planning

Companies will assess the potential effects of their projects and will integrate protective measures into the planning process to prevent or reduce impacts upon the environment and on public health and safety.

Environment and resource use and public health and safety considerations will join economic, technological and operation evaluations as fundamental components of the planning and decision-making process. This approach will satisfy sound business principles while ensuring that planning, development and operating decisions reflect sensitivity to environmental issues and concerns.

This principle emphasizes the importance of anticipating potential positive and negative effects upon the environment, understanding the interactions and potential consequences between projects and the environment, and the necessity of taking action. To ensure that appropriate action is pursued, environmental planning will be incorporated into all aspects of project design and development.

Anticipating a project's environmental impacts and its associated effects upon public health and safety will enable companies to develop strategies which ensure that impacts and risks are managed. This process will not be limited to new projects nor applied only at the approval stage. Rather, it will be applied to all activities from initiation to decommissioning. It represents a long-term commitment to environmental protection and maintenance of public health and safety.

Consultation

Companies will provide relevant information in a timely fashion to the public and to governments with respect to corporate policies and activities and will be responsive and sensitive to community concerns.

Appendix B: Environmental Code of Practice (cont'd)

Consultation (cont'd)

The need for and the extent of consultation depends on the location, size and nature of an operator's activities. Companies are committed to determine the need to consult early in their planning process. The consultative process will include education, information and communication.

Companies will foster the consultation process by creating the mechanisms required for allowing effective communication during the various phases of the project or activity. Responsibility for this process will be assigned to individuals who have decision-making authority. Consultation meetings with governments, communities and the public will be held early in the process to ensure that sufficient time is available to present all the relevant information, listen and respond to concerns and implement corrective action. In some circumstances, member companies will consider funding directly affected parties to provide access to necessary technical expertise and to facilitate their participation in the consultation process.

Consultation does not mean that companies will be required to divulge information which could affect their competitive position, and they must retain the right to manage all aspects of their operations.

Compliance

Companies will comply with applicable laws and regulations and will adhere to the intent of industry guidelines.

Companies will develop and participate in environmental compliance programs. These programs include environmental audits, inspection and monitoring. Environmental audits (reviews) will be systematically conducted by each company. The results of the audits will be confidential and will be the responsibility of the corporate officers. These

Appendix B: Environmental Code of Practice (cont'd)

Compliance
(cont'd)

audits will be used by the company to assess their compliance with corporate policies, government regulations and industry guidelines, and to identify deficiencies and develop programs for improvement.

Companies will implement inspection and monitoring programs to detect and minimize unanticipated incidents which may result in a state of noncompliance. If such events occur, corrective action will be taken.

Companies will cooperate with government representatives in the development of abatement programs. If a company wilfully or wantonly violates laws and regulations, member companies fully support firm enforcement of the law to protect the environment.

Industry associations will continue to serve as a vehicle for companies to cooperate in developing industry guidelines. The guidelines will periodically be reviewed and updated to ensure that they reflect the best practical technology.

Corrective Action

Environmental damage caused by company activities will be corrected in a timely and efficient manner.

If oil and gas development activities result in negative impacts on the environment, timely corrective action will be taken. Corrective action is the response to a situation or practice which will or has potential to have a negative effect on public health and safety.

In most cases, corrective action will be based upon established corporate plans and procedures or industry guidelines. The speed with which action is pursued will depend upon the potential risk

Corrective Action (cont'd)

to human health and safety and the risk of the impact increasing. If the impact is limited and controlled, specific actions may take advantage of operational circumstances, including timing to avoid seasonal constraints.

If environmental protective measures cannot reduce damages to acceptable levels, companies will make every effort to negotiate compensation agreements directly with the affected property owners.

Emergency Response

Companies will implement programs to minimize the consequences of emergency events by ensuring prompt and effective response.

The fundamental assumption underlying the emergency response principle is that all available and practical resources and skills will be brought to bear to bring an emergency under control.

While the probability of an emergency event occurring during oil and gas operations may be low, should it occur its consequences could be severe. Accordingly, prevention of such emergency events will be the industry's first priority.

Companies will develop timely and effective response plans to deal with possible emergencies. The complexity and detail of the emergency response plan will depend upon project specific factors, assessment of risk and potential consequences of an emergency incident.

The components of emergency response plans will include: an operational plan which defines decision-making authority, methods of implementation, and available resources; a communication plan which includes internal and external communications

Emergency Response (cont'd)

segments; and procedures by which the plan can be evaluated.

Research

Companies will encourage and support research relevant to improving industry's ability to protect the environment and maintain public health and safety.

Research refers to any discrete project designed to develop and assess new designs and procedures in response to current or anticipated problems and must be based on good science. Research supported by companies primarily responds to questions of "need to know" as distinct from "nice to know".

Where there is reason to believe that the environment faces damage, or there is a risk to public health and safety, companies will use research as one means to improve related designs and procedures.

Companies will cooperate in developing and implementing research with industry associations, other companies, government agencies and directly affected parties. To successfully achieve the research objectives, every effort will be made to develop a consensus on the studies to be conducted and the research methods to be employed.

The results of non-proprietary research programs will be available to the public and effectively communicated to directly affected parties.

CANADIAN WESTERN NATURAL GAS
COMPANY LIMITED

NORTHWESTERN UTILITIES LIMITED

10035 - 105 ST.
EDMONTON, ALTA.
T5J 2V6

January 15, 1991

Clean Air Strategy for Alberta
2nd Floor, Highfield Place
10010 - 106 Street
Edmonton, Alberta
T5J 3L8

Dear Sir/Madam:

RE: SUBMISSION TO CLEAN AIR STRATEGY BY CANADIAN WESTERN NATURAL GAS COMPANY LIMITED AND NORTHWESTERN UTILITIES LIMITED

THE COMPANIES

The business of Canadian Western Natural Gas Company Limited (Canadian Western) and Northwestern Utilities Limited (Northwestern) is the production, transmission and distribution of natural gas. Canadian Western has served southern Alberta since 1912, and Northwestern has served central and northern Alberta since 1923.

Today the companies provide natural gas service to more than 650,000 customers in 294 communities. Combined, we employ over 2,800 employees and have approximately 35,000 km of transmission and distribution pipelines. Revenues in 1989 amounted to over $655 million.

Throughout our history, the companies have been associated with clean air because of the clean burning nature of natural gas in comparison with other fuels. This factor resulted in our companies being environmentally conscious long before clean air became a major public issue. The companies are currently active participants in research and development of environmentally beneficial projects such as natural gas vehicles, cogeneration and turbo expanders. We have experience and expertise that will be of significant value in the further stages of environmental policy and legislation development.

INTRODUCTION

In attempting to develop a Clean Air Strategy, the government has committed itself to an enormous undertaking.

We support the efforts of the government to solicit input from the public and industry in the review of government strategies and also ultimately, in the legislation development process.

With this input, coupled with what has been learned from other provinces and countries, we are hopeful that this effort will ultimately result in a strategy incorporating operating guidelines or legislation which will benefit every Albertan and be administered in a fair and consistent manner to all.

Obtaining the cooperation of Albertans is vital for the successful implementation of the Clean Air Strategy. Their trust must be won by the development of strategies, guidelines and legislation that incorporates the input submitted to the consultative strategy development process.

Following are our views and recommendations of what is required for the development of the Clean Air Strategy for Alberta. This information has been categorized under the headings utilized by the CASA review process.

STANDARDS AND REGULATIONS

It is the role of government, aided by the consultation process, to set standards and regulations. However, the methods used to meet or exceed such requirements should be left to industry to decide. Proposals for standards and regulations should bear substantive evidence as to the necessity of their consideration. They must be developed in a scientific manner and not include misleading recommendations.

Data bases must be established for areas of significant clean air concern. The emissions inventories done for Alberta on carbon dioxide, sulphur and nitrogen are examples of the type of information needed for developing effective strategies and policies, not only for government legislation but also for the reference of industry and other stakeholders.

When proposing new standards and regulations the government should ensure that these proposals are attainable and reasonable with respect to the impact on the economy of the province, the consideration to regional issues and the prioritization based on criticalness. Also, when proposing new standards and regulations it is vital that the methods of administering them and time frame guidelines be specified within the proposal.

All parties which may be affected by such proposed standards should be informed of the propcsed changes as soon as possible so that they can provide input in the process and be better prepared for compliance requirements.

Consultation with the federal environmental authorities should be included in the process of establishing provincial standards.

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ECONOMIC INSTRUMENTS.

Government should support industries, businesses, and individuals which operate in an environmentally responsible manner.

Government initiated economic incentives or deterrents must be applied with very careful consideration, so as to achieve the intended outcome.

Companies should be allowed to include investments in energy efficiency as a business cost. For utilities, this would mean allowing such costs to be included in its rate base. This type of incentive would enable businesses to implement energy efficient, environmentally responsible measures as potential business opportunities rather than being viewed merely as a financial burden.

ENERGY EFFICIENCY AND CONSERVATION

To accurately assess the environmental efficiency of a business' or an individual's activity each must be subject to the same evaluation process. Full cost accounting, assessing the environmental impact of products and operations for the full cycle of their use, should be the basis of any evaluation.

Incentives should be offered to encourage energy efficiency audits, and the implementation of energy saving options.

Support should be given to those who are prepared to convert to less polluting fuel sources.

The government should set an example to others by ensuring energy efficiency and conservation policies are implemented for all its operations.

EDUCATION AND INFORMATION

Organizations and individuals must be made aware of how their actions affect the environment. Such knowledge is necessary if those organizations and individuals are to develop and implement effective means to reduce harmful effects on the environment.

Albertans must ultimately be able to make decisions based on adequate knowledge and understanding of the issues at hand. Environmental education and information dissemination should be enhanced by a joint effort of industry, education and the government.

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Corporations should be encouraged to educate their employees and the public through environmental programs. The government can assist in this area by determining whether information used is accurate and unbiased.

Education programs in our school systems should include environmentally responsible lifestyle courses.

In addition to the energy consumption data presently shown on appliances, a rating of appliances with respect to environmental impact considering full fuel cycle should be attempted.

A public resource centre should be established with complete and accurate information on the issues concerning the environment.

SCIENTIFIC AND TECHNOLOGICAL RESEARCH

A system should be developed to ensure information transfer is promoted and to avoid duplication of effort in research. This would enable us to direct our financial resources for research more effectively. Coordination of this undertaking should involve all levels of government.

Studies must be done to enhance our understanding of how emissions affect the atmosphere and ecosystem. Climate modelling can then be done with greater reliability to demonstrate the potential effects of implementing a regional air shed use change.

An environmental research centre of excellence should be established at one of the Alberta universities in conjunction with industrial groups and the Alberta Research Council.

The use of alternate fuels should be thoroughly studied to fully assess their fuel cycle cost.

Research should be supported in those areas which offer promising solutions to our atmospheric problems.

FUTURE DEVELOPMENT

The Clean Air Strategy for Alberta proposal only considers emissions from the production and use of energy in Alberta. The Clean Air Strategy should be expanded to consider other emission sources, such as waste disposal, agricultural practices, and industrial processes.

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CONCLUSION

It is clear that this process of strategic development is a never ending one.

We look forward to participating in the continuing development of this strategy, and in other strategic developments yet to come.

Yours very truly,

L.D. Bruce
Vice President, Marketing

LDB/kk

alberta forest products association
104 - 11710 kingsway avenue, edmonton, alberta T5G 0X5
telephone (403) — 452-2841 fax (403) — 455-0505

January 15, 1991

Clean Air Strategy for Alberta
Bag One, Mail Room, Main Floor
North Tower, Peroleum Plaza
9945 – 108 Street
Edmonton, Alberta
T5K 2G6

To Whom It May Concern:

Attached please find our submission regarding the Clean Air Strategy for Alberta. If you require further information please do not hesitate to contact our office.

Yours truly,

Garry Leithead
Executive Director

/bp
encl.

alberta forest products association
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telephone (403) — 452-2841 fax (403) — 455-0505

SUBMISSION TO THE CLEAN AIR STRATEGY

The Alberta Forest Products Association is pleased to make this submission to the Clean Air Strategy examining air quality. The AFPA represents 70 Alberta–based companies involved in the manufacture of forest products, including lumber, panelboard, pulp and paper. Our mandate encompasses lumber grading, government affairs, safety, transportation, forestry, public affairs, environment and offshore market promotion. Our membership constitutes Alberta's fourth largest industry, employing 27,000 people and in 1990, representing $1.4 billion in annual sales.

The AFPA, which has represented Alberta forest industry companies for more than 50 years, is committed to responsible environmental controls and standards and to regeneration of our forests. We have backed up this commitment with an announcement in early November of our desire for public input into developing a Forest Care process; a self regulatory code of principles , which set our own standards, displaying responsibility in areas where we have the expertise. The direction we are taking covers many of the principles which are contained in the background documents for the Clean Air Strategy. Our new code will set industry guidelines in six areas: forest management, environmental standards, land use, public communications, employee safety and sustainable economic growth.

We want our Forest Care Code to reflect the beliefs and goals of all Albertans, as well as those who work in our sawmills, pulp and paper mills, panelboard and woodland operations. This code will act in harmony with environmental legislation in Alberta and in Canada as a whole.

The pulp and paper sector of the AFPA use large amounts of energy in the form of natural gas and electricity. The electricity used is mainly generated in coal fired generating plants but significant amounts are generated from In-House generating plants which burn biomass (hog fuel) and dissolved organic compounds from the kraft pulping process. Virtually all the steam used to manufacture this electricity is then used in process heating. The solid wood sector of the industry use some natural gas and biomass heating systems to heat kilns and buildings. The major emission issue for this sector comes from the disposal of by-products namely bark, sawdust and shavings. These by-products have traditionally been burned in teepee burners. The development of the pulp industry in Alberta has been beneficial in that residual chips previously burned are now sold to pulpmills and are now being made into pulp and paper. In addition the concerns regarding landfilling of pulp and paper mill effluent treatment sludges is requiring the industry to review the potential incineration of this material at locations where burning is not currently practiced.

The industry recognizes that emissions from incineration impact the environment and are taking steps to improve the situation. The Canadian Pulp and Paper Association have studies underway to obtain better understandings of emissions from pulpmills. The AFPA is working in conjunction with Alberta Environment, Economic Development and Trade and Forest Industry Development Division of the Alberta Forest Service to better understand and make recommendations regarding use of teepee burners.

It should be pointed out that the forest industry is not a major contributor in the categories of CO_2, SO_2, NOX. Enclosed are three graphs illustrating emissions from several identified industry sectors. They are prepared from a background document "In Support of the Issues and Options Workshop, September 6-8, 1990" J.D. Smith, Albertan Energy and H. Sandhu - Alberta Environment. As such the priority of emission standards for the forest industry should certainly be less than say the energy industry, electrical generation facilities and the oil and gas sector.

Our forest products industry has responded quickly to the environmental concerns expressed by the people of Alberta. Our pulp and paper mills are committed to some of the most stringent environmental standards in the world and have been leaders in implementing technology in order to meet this demand from Albertans.

Several larger solid wood sector companies are installing systems which either eliminate or significantly reduce air emissions from waste wood disposal burners. Smaller operators are experiencing difficulty in changing their operations due to the economics involved and consideration should be given to their location and the relatively low impact of their emissions.

CONCERNING REGULATIONS

The forest products industry produces large volumes of waste such as bark, sawdust, planer shavings, effluent treatment plant wastes and trim blocks from our solid wood, pulp and paper processing installations. While some of this refuse is incinerated to produce electricity and/or process steam, significant quantities are either burned or landfilled. In certain locations, cogeneration power projects may be economically feasible which will provide for energy efficient disposal of our by-product refuse but these situations will be relatively few. The above arrangements provide for the most effective management of energy and environment impacts. In order to minimize landfill, the burning of wastes in combustion devices is most desirable. The regulatory agencies must be sensitive to these needs and develop regulations which are cost effective and not onerous upon the operator.

We believe that environmental legislation can be strengthened by coupling it with specific standards. For example, many jurisdictions in North America publish specific standards covering emissions as part of their environmental legislation. Alberta, on the other hand, has tended not to publish legislated standards. Companies require specific information within legislation to minimize uncertainty in their environmental planning, and long-term development goals.

Our members need to plan their operations, their expansions and their environmental improvements years in advance. We need time to plan the best technology, to find the financing, to consult with the public, to gain the necessary approvals and finally to carry out the work. We need to know exactly what the standards are so we can plan effectively.

The AFPA and its members have traditionally worked closely with government in providing input towards the establishment of new regulations and standards. We believe there should be even more dialogue to ensure that regulations embody sustainable development, that is industrial growth without compromising the ability of future generations to meet their needs. In the same way, we request that the federal and Alberta governments work together in an attempt to achieve a "single-window" approach to environmental regulation so that Alberta forest companies can obtain clear, consistent interpretation of standards.

As an industry, we would like to see environmental standards developed in a defined and timely way. We support appropriate and proven technology, backed by our technical resources with access to a worldwide knowledge base.

The forest industry is different from the petroleum or petrochemical industries. We deal with a renewable resource which often can't be covered under the same regulations as a non-renewable resource. In the same way, regulations which cover a sawmill aren't necessarily appropriate for a pulp and paper operation — or for a dam or a coal-fired generating station.

We recognize that general regulations may be specific enough for some sectors of the forest industry. But other sectors may need site-specific regulations. This could be compared to a general speed limit for highways. The limit is sometimes raised for a divided, limited-access highway or lowered in areas where driving is more difficult. Similarly emission standards of those plants which are urban based may be more stringent than those that are rural based.

Just as we need a rational process for regulations we require a stringent and specific protocol outlining how regulations might be changed in the future.

The legislative process must be clear and orderly for everyone so that rational decisions are made based on credible scientific assessments of what is possible and desirable for the environment combined with economic assessments of the cost to the business and society. All of us must recognize that every project has an environmental impact, the same as every human action. It is up to the assessment process to ensure that the impact is minimal and acceptable.

As an industry, we believe that the recent draft Environmental Protection and Enhancement legislation is a positive step to update current laws and incorporate the need for public input into existing legislation. At the same time, we hope that the Alberta public and the government will understand that the forest industry exists in an increasingly-competitive world marketplace. We must continue to compete successfully despite the huge costs of meeting some of the most stringent environmental standards in the world, in addition transportation costs to international markets are significantly higher here in Alberta than in most other countries and provinces.

PUBLIC PARTICIPATION

The AFPA supports effective public participation in this whole process. We have, for example, set up a phone number where Albertans can call us collect to express their concerns. Public input is a key portion of our Forest Care Code. Public involvement has become an integral part of Forest Management Agreement planning.

We believe it's only fair that everyone should know exactly what form of public consultation will meet the requirements. Historically, companies have done what was asked of them, only to be told later that it was not enough, a no-win situation for everyone.

We are concerned, however, because some public participation has turned to grandstanding and sensationalism which is counter-productive. While formal public hearings have a strong quasi-judicial function, the AFPA believes that communication can often be enhanced in a partnership approach through roundtable or workshop sessions when developing regulations and standards. The Clean Air Strategy workshops offered a good example of effective communication by honest, sincere and concerned individuals. Environmentalists, academics and representatives from industry and government broke into smaller groups to discuss the various topics and then reported back to the group as a whole.

The forest industry is a relatively minor contributor of harmful emissions into the atmosphere. The industry recognizes that it is a contributor and is prepared to work with governments in reducing and wherever possible minimizing emissions. It is important to note that burning of wastes or buy-products must continue as a method for disposal.

In summary, we believe the following measures will improve the environment and still enable the industry to be viable:

1. Development of specific environmental standards and regulations for the forest industry in an orderly process that allows government and industry to effectively deal with environmental issues.

2. Effective public participation for input to environmental laws and regulations emphasizing a "partnership" approach.

3. Specific standards for the forest industry included within the framework of environmental legislation and, in some cases, site-specific regulations.

4. Standards and regulations for the environment based on credible scientific assessments while maintaining sustainable development.

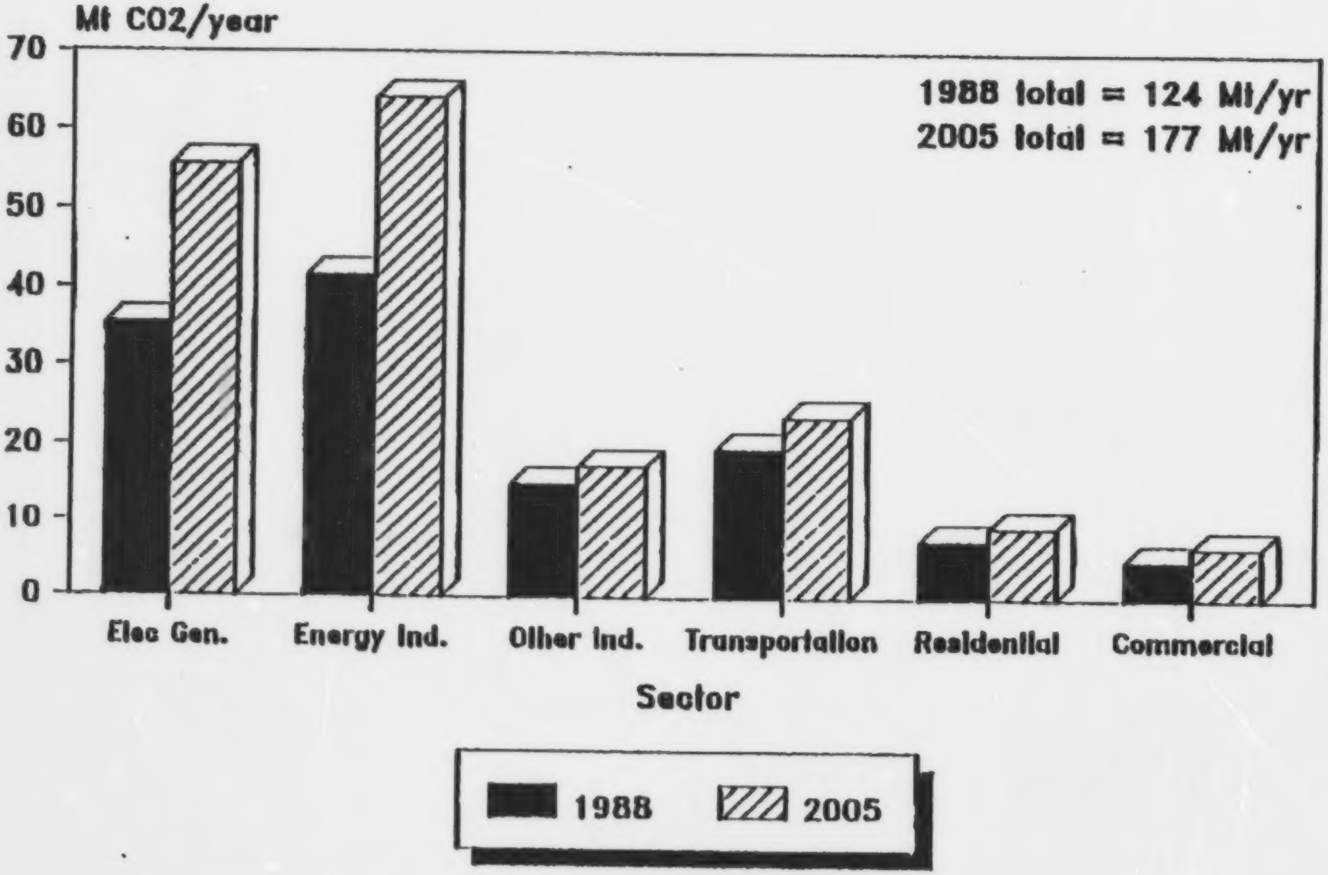
5. Establishment of a stringent and specific protocol outlining future regulation changes, including a system for ongoing communication and consultation.

6. Recognizing the competitive nature of the industry to ensure its position nationally and internationally is not eroded.

We believe that these measures will help to enhance and balance both environmental protection and industrial activity for the benefit of all Albertans.

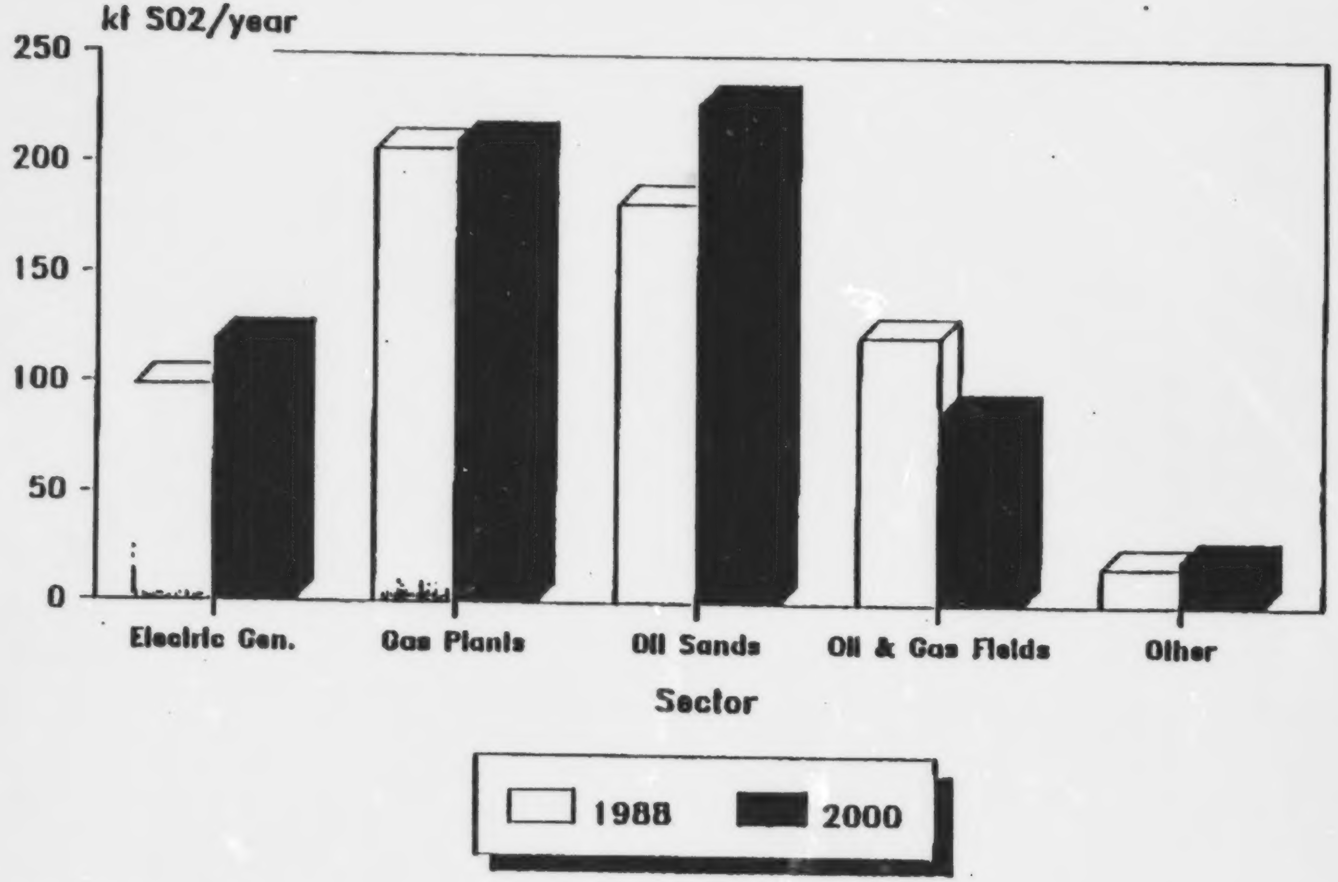
Submitted: January 15, 1991

Alberta CO2 Emissions
(In Megatonnes/year)



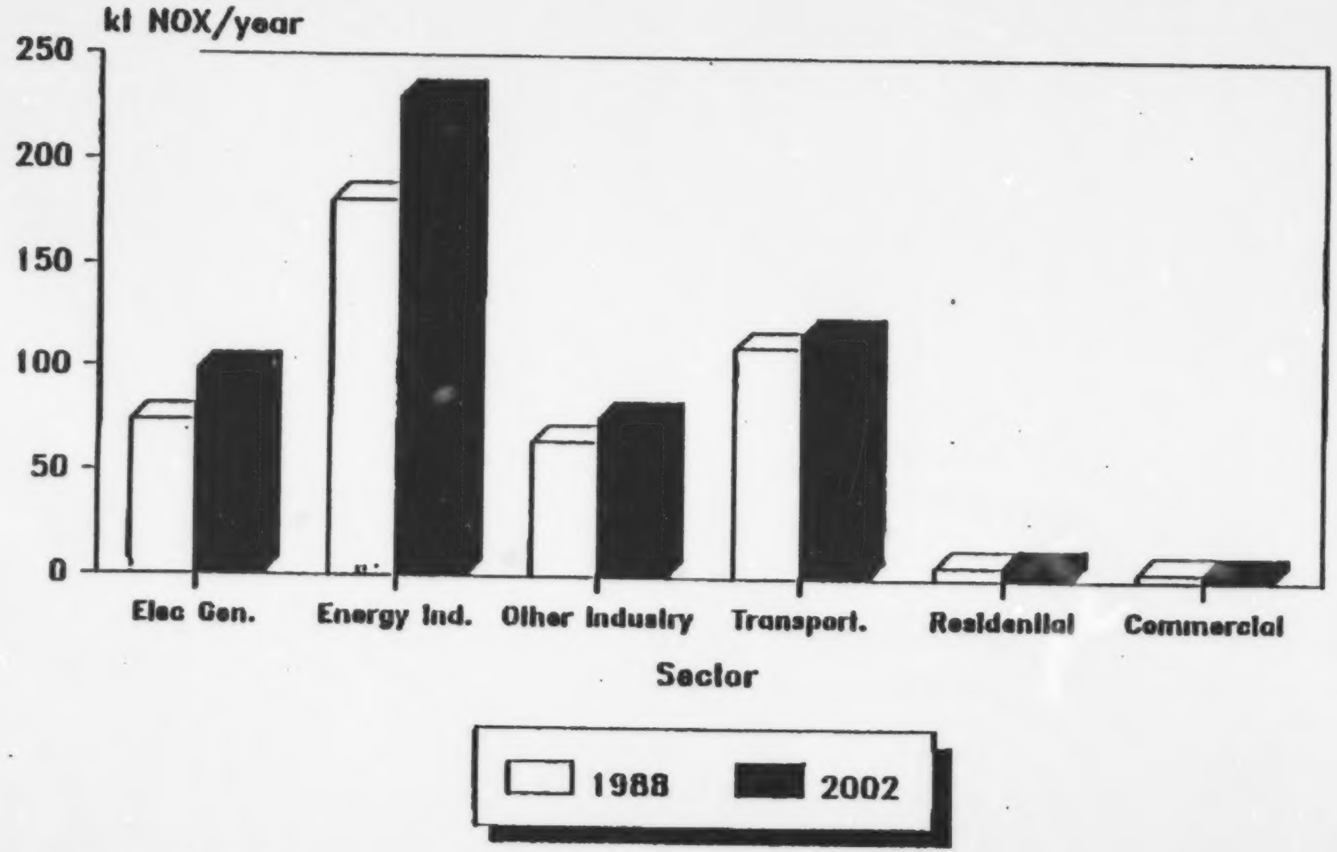
Based on ERCB 89-A Report

Alberta SO2 Emissions
(In Kilotonnes/year)



Based on data from ERCB Gas Dept.

Alberta NOX Emissions
(In Kilotonnes/year)



Based on ERCB Report 88-C

O.S. process gas and coke not included

CH4 International Ltd.

808 - 48 Street, N.E.
Calgary, Alberta, CANADA
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Telephone 1 (403) 273-6296

1991-01-10

Clean Air Strategy for Alberta
Bag One, Mail Room
Main Floor, North Tower, Petroleum Plaza
9945 - 108 Street
Edmonton, AB T5K 2G6

Attention: Vern Millard, Forum Moderator

Re: Full Copy of Our Presentation at the Calgary Forum

Dear Mr Millard;

Please accept my apologies for the delay in forwarding the full copy of my presentation at the Calgary Forum (enclosed), on December 5, 1990, but I have been away for awhile.

My compliments on running a well moderated forum. I have, however, a concern that the Alberta government may only be paying lip service to an improved environment given their track record with the Old Man River dam and the latest pulp mill approval before all environmental concerns have been addressed, and also that many of these regional session hearings are postdating the submission to the CCME, and thereby the WCC in Geneva. But I suppose such is the way of our governments.

I also would like to mention, for the record, some observations on the individual brochures (blue sheets). First, on the Methane sheet, our work indicates that the global annual methane emissions for coal mining is about 58 megatonnes, not 35, which is a USDOE figure, which makes US coal mines look somewhat better, and does not sufficiently take into consideration the larger emissions from underground mines worldwide. Second, on the Greenhouse Effect sheet, the current g-h gas contributions by Environment Canada are in disagreement with the World Resources Institute, which gives: CO_2 - 49%, CH_4 - 18% (double Envir. Cda.), N_2O - 6%, Others - 13%.

I would ask that CH4 International and I be considered in further processes, and be placed on any list for notification. Thank you for your consideration.

Sincerely,

Peter J. Proudlock
President
CH4 INTERNATIONAL LTD.

enclosure

ATMOSPHERIC EMISSIONS OF FUGITIVE METHANE IN ALBERTA

A Submission to Clean Air Strategy for Alberta Forum
Calgary, Alberta, December 5, 1990

Submitted by: Peter J. Proudlock, President, CH4 International Ltd.
808 - 48 Street N.E., Calgary, Alberta, Canada T2A 4L9
Phone/Fax: 1 (403) 273-6296

CREDENTIALS

Good evening, my name is Peter Proudlock. To state simply, my credentials in making a presentation here to the Clean Air Strategy for Alberta, are:
My company, CH4 International Ltd., works with methane gas, as an alternate fuel source from coal seams, coal mines, landfills, etc. I graduated as a geologist from the University of B.C., and my experience in the field of methane has been for over the past ten years. Some of our recent work has also included investigations into the emission of fugitive methane into the atmosphere for the Federal - Provincial Joint Task Force. Earlier this year, as Canada's invited industry representative, I attended the 40 country "International Workshop on Methane Emissions from Natural Gas Systems, Coal Mining and Waste Management Systems", sponsored by the U.S. Environmental Protection Agency and the Environment Agency of Japan, held in Washington, D.C. for the U.N.'s Intergovernmental Panel on Climate Control. Our current work continues to be involved with methane recovery and emission control.

My presentation will address atmospheric emission of methane, its affect and a some suggestions for reduction.

THE EFFECT OF METHANE ON GLOBAL WARMING

1. The Half Earth from Space

The earth, when viewed from space, has a very thin shell protecting us from solar radiation, and its affects on us; we term this fragile shell our atmosphere.

2. "Historic Increase in Atmospheric Concentration of CO_2 & CH_4"

Man's activities, over especially the last century, have dramatically altered the chemical make-up of the atmosphere. For example, we have measurements of the atmospheric concentration of carbon dioxide and methane since about 1750, and not only have the concentrations been steadily increasing, but the rate of increase is also accelerating. Methane emissions to the atmosphere are considered as part of the package of greenhouse gasses responsible for global warming.

3. "Greenhouse Gasses - Global Warming 1980's"

In 1988, the World Resource Institute estimated that 18% of the man-made contribution to the greenhouse effect comes from methane gas.

4. "Contribution to Global Warming by Major Greenhouse Gasses"

Although the contribution of carbon dioxide at 49% is greater than that of methane, the growth rate of the methane concentration, at 1% annually, is twice that of carbon dioxide.

5. "Effect Relative to CO_2 & Mean Residence Time of Major Greenhouse Gasses"

Since methane is about 60 times as damaging to the atmosphere as carbon dioxide by weight (and over 20 times by volume), and has a mean residence time of 10 years, versus 2 to 3 years for carbon dioxide, then a considerable effort should be given to reduce atmospheric emissions, and to maximize utilization.

6. "Climate Impact of Methane Emissions"

The U.S. E.P.A. in 1990 released findings that indicate that reduction of methane has a far greater affect on global warming, especially in the short term (1 year), where the impact is about 120 times that of carbon dioxide by weight (45 times by volume).

The man-made emission of fugitive methane comes from such major sources as: coal mining, the petroleum and natural gas industry, landfills, wastewater, animal wastes, land use changes and rice production. Although rice production is definitely not a consideration in Alberta, the other sources are, to varying degrees. These sources are controllable to some extent, and control would assist in the reduction of the greenhouse effect.

METHANE EMISSIONS FROM COAL MINING

7. "Coal Gas - Typical Analysis"

Almost all coal contains gas. This gas is produced as part of the coalification process; the amount of gas produced is very large. This coal gas is predominately methane (>95%).

8. "Coal Gas - Present in Coal in 2 Forms"

Most methane within coal is adsorbed, and as such the pressure within the coal is fairly low, much lower than gas in a conventional reservoir at similar depths. Only a small amount (about 5%-10%) is free gas within the porosity. This free gas is in equilibrium with the adsorbed methane, and because of the relatively low confining pressures, the methane remains adsorbed.

9. Coal Mine

Once the pressure is disturbed, as with dewatering caused by mining, the free gas is released, and desorption starts to proceed. The amount of gas that can be contained within a coal reservoir greatly exceeds that which would be contained within a conventional reservoir under similar conditions, therefore, the amount of gas released from coal can be considerable.

10. Variation in Methane Adsorption With Rank & Depth (Drawing)

The volume of gas in coal, which is emitted when mined, is dependent upon rank and depth. Since much of Alberta's coal production comes from shallow, lower rank plains coal, the emissions are not expected to be high per tonne of coal, but almost 20 million tonnes are mined annually. Presently, coal mined in the mountains (about 10 million tonnes per year), is reported to be not overly gaseous, but coal in some areas of the province is very gaseous. Besides the gas within the mined coal, any gas contained within smaller adjacent seams and any carbonaceous material disturbed by mining will be released, and this amount is often much greater than that within the recovered coal itself.

11. "Canadian Coal Mining - 1988"

Our work has indicated that Canada emits about 500 million cubic metres of methane per year from 70 million tonnes of coal mined. We have not precise figures for Alberta, but Alberta mines considerable coal (over 40% of Canadian production), and a proper testing programme to ascertain the quantity needs to be conducted. Methods exist to economically predrain gas prior to mining. Where this is possible, the gas should captured in areas and it should be utilized.

12. "World Coal Production & Methane Emissions"

Another benefit of refining the technology to recover this gas from coal mining is that this technology is required worldwide, especially in developing countries, to which we would have a valuable export of technology. Worldwide, about 4.6 billion tonnes of coal are mined; from this we estimate that 81 billion cubic metres of methane were emitted in 1988.

Although Canada's share is less than 1% of this, it is important that we are progressive and indicate to the world that we are serious about reducing emissions. The developing world, especially China for instance, relies heavily on coal for energy. China has recently stated that for at least the next 20 to 30 years they will be increasing their coal output. In that China alone accounts for 1/3 of the world's emissions from this source, and this will increase, it is imperative that the developed countries, such as Canada, develop the technology to both recover and utilize this gas, which is so damaging to the atmosphere. The Soviet Union and Poland are also large emitters, and potential technology customers.

13. Coal Mine Drainage Systems (Drawing)

The United States, which ranks second, is currently collecting a considerable amount of methane, and making money doing so. They are currently expanding their collection systems, which are mainly surface predrainage wells. Canada, also, has excellent demethanation technology, and can excel in underground systems.

14. "World & Canada 1988 Mining Methane Emissions"

Given proper technology, and the will, we estimate that 50% of emissions from coal mining can be economically recovered.

METHANE EMISSIONS FROM NATURAL GAS SYSTEMS

15. Gas Plant

Alberta has a strong natural gas industry; indeed 85% of Canada's production comes from this province. Over 100 billion cubic metres of natural gas are produced annually. The provincial average methane content is 81%, or about 85 billion cubic metres produced.

16. Flare Stack

About 2 billion cubic metres of methane, or 2%, is listed as "flared". Not all of this is actually flared, some is lost as fugitive methane. Although we have no data, we have estimated that perhaps 5%, or 100 million cubic metres is vented as fugitive methane emissions; much of this could probably be recovered.

17. Compressor Station

In areas of the world where older distribution systems are in use, there is leakage that is unaccounted, but Alberta's systems are new, and the quality of repair and maintenance is high, so this loss is minimal.

18. Gas Flaring

Most losses occur in the testing, flaring of solution gas, etc. where incomplete combustion might occur. This is certainly an area that needs evaluation.

19. Meter Station

This, however, is only the amount that is originally metered, or from wellhead to burnertip. There is no accounting for gas lost from oil production and other leaks and orphan wells that have long since been abandoned but are leaking.

20. Service Rig

Some companies are facing high costs trying to control casing gas leaks, especially in areas of the plains where rock is poorly consolidated.

21. Logging Unit

The technology of geophysical logging in Alberta is second to none in the world. We now have the capability of measuring leaks of less than one cubic metre per day. Another unaddressed area of concern is where a leak behind casing from a deeper, higher pressure reservoir has been allowing gas to flow up the wellbore, but into another higher, lower pressure zone.

22. Well Head

Given a long and large enough leak, especially if the same problem exists in a number of wells, then this zone becomes overpressured, and in poorly consolidated rocks, eventually this gas will migrate to surface and enter the atmosphere as fugitive methane. It is also a drilling hazard. The technology to measure these leaks behind casing and poor cement bonds has been developed by one Alberta firm, Roke Oil Enterprises. Probably other Alberta technologies, which are not in common usage, have equally as important implications. I have been in R&D for over a decade, and know the difficulty in introducing new quality ideas; it just is not "Canadian" to brag that "I am good", or "we have the best".

23. Drill Rig

We know these types of leaks exist; we do not know the magnitude. The implication is that the natural gas industry unwittingly emits a considerable volume of undetected fugitive methane. This area most certainly needs to be evaluated, for if there is a move to switch to natural gas, drilling and leakage will increase. Part of this increase in natural gas production will come from coalbed methane (produced from surface, as opposed to recovery from mining activities), which is already starting to be investigated in the province. Coalbed methane is becoming a significant source of natural gas in the U.S.A., where, for example, about 7000 wells will be completed this year, and where in Alabama, 15% to 20% of production is coalbed methane. We are faced with the fact that if fugitive methane leaks exceed about 1% of production, the advantage in reducing carbon dioxide and the greenhouse effect is lost; therefore, we must know how serious this problem might be, and how to reduce or eliminate it economically.

METHANE EMISSIONS FROM LANDFILLS

24. Landfill Site

The generation of methane as part of the decomposition of organic waste in landfills is well known. Up until the early 1970's, however, this gas was considered a nuisance at best and a hazard at worst.

The make-up of land fill gas is about 50% to 60% methane, the bulk of the rest being carbon dioxide. In many areas this gas is now being recovered at a profit. No such operations exist in Alberta. I do not have accurate numbers for Alberta, but considerable research has been done worldwide. For instance, a New York site of 600 hectares, 12 metres deep was shown capable of producing 1.1 billion cubic metres of 55% methane gas per year for a minimum of eight years. This research also includes upgrading and use of the gas as-is, which has the same corrosion characteristics as natural gas and with less NOx and CO emissions.

A detailed study is necessary before an estimate of the quantity of fugitive methane emissions from landfills in Alberta that can be captured. The number of sites, their sizes, composition and distance from markets needs to be addressed.

METHANE EMISSIONS FROM WASTEWATER SYSTEMS

25. Sewage Plant

Anaerobic digestion of municipal wastewater has been in use for a century. This process produces by-products such as methane, carbon dioxide and hydrogen sulphide.

26. Electric Generators

The methane gas is easily captured and used. Alberta is currently doing well in some jurisdictions in this area. For instance, the City of Calgary's Bonneybrook Plant generates about 30,000 cubic metres of methane per day from a flow of about 400 million litres of sewage.

27. Power Generation & Heating

About 80% of this is captured and utilized for heating and electricity generation for peak shaving. Base load displacement has not been economic. When I last visited the plant about a year ago, expansion of the capture and usage facilities was underway to improve on the 80%.

Detailed studies of all Alberta treatment plants should be undertaken, to ascertain if methane recovery at the smaller plants can be economic.

METHANE EMISSIONS FROM ANIMAL WASTE

28. Cattle

Anaerobic digestion of animal manures has been demonstrated to be an effective resource management tool. The system is effective in reducing pathogen and nutrient levels in the manure and in preserving the water quality in streams; methane is a major by-product of the process. On farms, capture systems do not need to be high-tech to be effective, and a medium calorific value gas is generated for use by the animal husbandry facility for heating or electrical generation.

I have no figures for Alberta, but a recent U.S.A. study indicated that about 30 billion cubic metres of biogas could be produced annually in the States. Investigations into the use of such systems under Alberta's conditions are worthwhile. As to the recovery, given Alberta's large range beef industry, perhaps 5% might be suggested.

METHANE EMISSIONS FROM LAND USE CHANGES

29. Slash Burning
30. Pulp Mill
31. Dam

In many areas of the world, large quantities of methane are emitted as a result of land use changes, such as deforestation, drainage of swamps, etc. Alberta is not likely a large contributor to this area, but certainly when large pulp mills and dams are planned, changes must take place. The magnitude of such changes and the affect these changes have on the emission of methane, as well as carbon dioxide needs to be looked at.

32. Logging
33. Smoke Blocking Sun

It may be that these effects are minimal, but we certainly lack credibility in criticizing other areas of the world, especially deforestation in developing countries, when we are doing the same thing here. We need hard numbers to back up arguments on what the differences are.

METHANE EMISSIONS FROM OTHER SOURCES

34. Calgary Skyline & Highways

Our work has identified some sources of fugitive methane emissions in Alberta, but there are certainly others, that detailed studies will reveal; automobile exhaust is one such source. In reducing fugitive methane emissions, all areas need to be investigated. If we simply concentrate on a single large source, we may miss a much larger overall abatement by harnessing a number of lesser sources.

CONCLUSION

35. "Canadian Methane Emissions & Estimated Recovery by Industry Segment"

I have discussed a number of areas of fugitive methane emissions, which are controllable to varying degrees. I am most knowledgeable of coal mining emissions, to a lesser extent in the area of conventional natural gas systems, and plead near ignorance in the other areas, but our research into methane emissions in one area has led to some knowledge of others. I have come here tonight to bring light on some areas of concern, areas needing investigation, and perhaps ideas for further research.

Work we did earlier this year has given us the following estimates of recovery by industry segment in Canada, and in some areas a guess only has been made. Because Alberta is an energy rich province, we can certainly recover 10%, and will probably be able to recover about 25% of the Canadian total.

CANADIAN METHANE EMISSIONS
& ESTIMATED RECOVERY BY INDUSTRY SEGMENT

Industry Sector	1989 Methane Emissions Millions m^3	Estimated Potential Recovery
Coal Mining	500	50% = 250
Oil & Natural Gas	2,000	10% = 200
Landfills	1,600	+/- 30% = 500
Wastewater	+/- 400	80% = 320
Animal Waste	? 1,000	? 5% = 50
Changes in Land Use & Other	?	? ?
Totals	? 5,500+	? 1,320+

36. Natural Gas Vehicle Fueling

Additionally, switching to methane from higher hydrocarbons, especially oil and coal has other advantages in reducing the greenhouse effect. For example, coal gives off about twice the amount of carbon dioxide per unit of energy recovered as does methane. This fact, that methane is such a clean fuel, gives rise to the prediction that public pressure will create a demand and a rise in price, possibly doubling, even within this decade, without any other outside influences.

I trust I have presented some new information on fugitive methane emissions from man-made sources in Alberta, indicated some sources in need of improvement and suggested areas lacking adequate informantion.

37. "CH_4 = $"

Not only is methane a clean fuel, is a valuaable resource. Hopefully, through sensible investigations and research, economic solutions to the reduction of these emissions through capture and utilization can be found.

38. Coal Mine Explosion

As in the case of the early efforts to eliminate a hazard from coal mining, it has been found that the methane itself is valuable, hopefully the same can be said of recovery from other industry segments.

39. Sulphur Pile & Stack

Another comparison might be how valuable sulphur is in Alberta, and to think that sour gas was once flared.

40. Whole Earth From Space

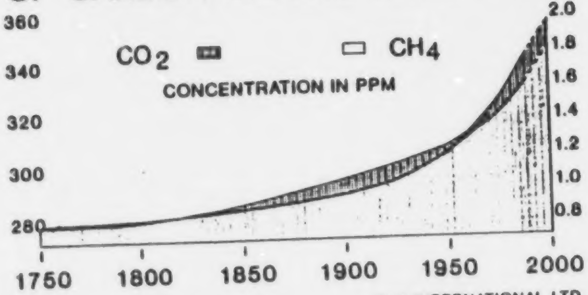
I implore the Government and People of Alberta to consider long and hard the consequences of not investigating and doing all we can to protect our fragile atmosphere. This is a small planet, and we all must do our share to protect it; the cost of not doing so may be beyond our means to pay. Thank you.

Photocopies of title slides and drawings are attached. (Note: correction to title slides reference "World Research Institute" should read "World Resources Institute".)

References and further information may be obtained by contacting:
Peter J.Proudlock, President, CH4 International Ltd.
808 - 48 Street N.E., Calgary, Alberta, Canada T2A 4L9
Telephone/Fax: 1 (403) 273-6296

②

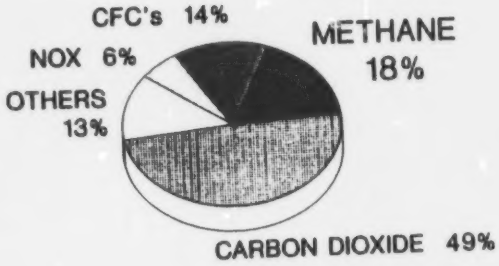
HISTORIC INCREASE IN ATMOSPHERIC CONCENTRATION OF CARBON DIOXIDE & METHANE



Source: Arking/NASA, 1990; et al CH4 INTERNATIONAL LTD.

③

GREENHOUSE GASES
GLOBAL WARMING - 1980's



Source: World Research Institute CH4 INTERNATIONAL LTD.

④

1989 CONTRIBUTION TO GLOBAL WARMING BY THE MAJOR GREENHOUSE GASES

Greenhouse Gas	Relative Effect	Annual Growth Rate
Carbon Dioxide	49%	0.5%
Methane	18%	1.0%
C.F.C.'s	14%	5.0%
Nitrous Oxides	6%	0.3%
Others	13%	1 - 5%

Source: World Research Institute, 1988 CH4 INTERNATIONAL LTD.

⑤

EFFECT RELATIVE TO CO_2 & MEAN RESIDENCE TIME OF MAJOR GREENHOUSE GASES

Greenhouse Gas	Relative Effect Per Molocule	Mean Residence Time: Years
Carbon Dioxide	1	2 - 3
Methane	20	10
Nitrous Oxides	200	150
C.F.C. - 11	13,000	70
C.F.C. - 12	20,000	110

Source: World Research Institute, 1988 CH4 INTERNATIONAL LTD.

⑥

CLIMATE IMPACT OF METHANE REDUCTIONS

Type of Impact on Global Warming	Impact Relative to CO_2	
	Per Kg	Per m^3
Immediate Impact over 1 year	120 times	45 times
Near-Term Cumulative		
over 50 years	55 times	20 times
over 100 years	35 times	15 times
Long-Term Cumulative over 500 years	~10 times	~5 times

Source: U.S. EPA Global Change Div., 1990 CH4 INTERNATIONAL LTD.

⑦

COAL GAS
TYPICAL ANALYSIS

METHANE	95 - 98%
CARBON DIOXIDE	TR - 5%
ETHANE, BUTANE, PROPANE, ETC.	1 - 8%
WATER (VAPOUR)	SATURATED

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⑧

COAL GAS
PRESENT IN COAL IN 2 FORMS

1. As FREE GAS (+/-10%) :
   In Fissures and Pores in the Coal, and in Associated Rock.
2. As ADSORBED GAS (+/- 90%) :
   On the Internal Surfaces of the Coal Micro-structure.

CH4 INTERNATIONAL LTD.

⑪

CANADIAN COAL MINING - 1988

		Million Tonnes	Portion
OPEN PIT MINING		66.5	95%
Bituminous	37.0		
Sub-bituminous	18.0		
Lignite	11.5		
UNDERGROUND MINING		3.5	5%
Bituminous	3.5		
TOTAL		70.0	100%

Source: Coal Association of Canada CH4 INTERNATIONAL LTD.

⑫

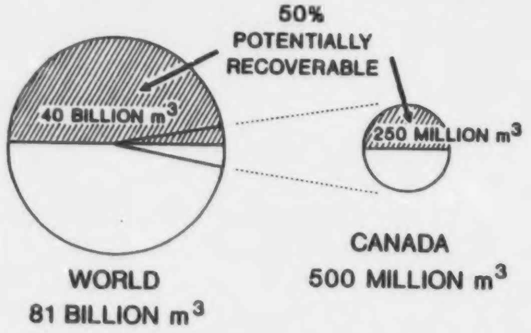
WORLD COAL PRODUCTION & CH_4 EMISSIONS

COUNTRY	MEGATONNES COAL U/G	SURF.	TTL.	CH4 EMISSIONS MILLION m3	%
CHINA	890	37	927	26,811	33.0
U.S.S.R.	430	330	760	13,890	17.1
UNITED STATES	330	490	820	11,370	14.0
POLAND	193	73	266	6,009	7.4
SOUTH AFRICA	111	62	173	3,516	4.3
INDIA	85	100	185	2,850	3.5
WEST GERMANY	79	109	188	2,697	3.3
UNITED KINGDOM	86	16	102	2,628	3.2
AUSTRALIA	47	143	190	1,839	2.2
NORTH KOREA	38	60	98	1,320	1.6
CZECHOSLOVAKIA	26	100	126	1,080	1.3
EAST GERMANY	0	303	303	909	1.1
SOUTH KOREA	22	0	22	660	0.8
FRANCE	11	59	70	507	0.6
CANADA *	4	66	70	500	0.6
SPAIN	11	55	66	495	0.6
JAPAN	10	0	10	330	0.4
OTHERS	119	100	219	3,870	4.8
TOTALS	2492	2103	4595	81,281	100.0

Sources: World Bank, 1987; * Masszi & Proudlock, 1989 CH4 INTERNATIONAL LTD.

⑭

WORLD & CANADA - 1988 MINING METHANE EMISSIONS



Sources: W.R.I.; Masszi & Proudlock, 1989 CH4 INTERNATIONAL LTD.

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CANADIAN METHANE EMISSIONS & ESTIMATED RECOVERY BY INDUSTRY SEGMENT

Industry Sector	1989 CH4 Emissions Million m3	Estimated Potential Recovery
Coal Mining	500	50% = 250
Oil & Natural Gas	*2,000	10% = 200
Landfills	1,600	+/-30% = 500
Wastewater	+/- 400	80% = 320
Animal Manure	? 1,000	? 5% = ? 50

* Mostly flared

Source: Masszi & Proudlock, 1989; et al CH4 INTERNATIONAL LTD.

㊲

METHANE DRAINAGE FROM COAL MINES

$CH_4 = \$$

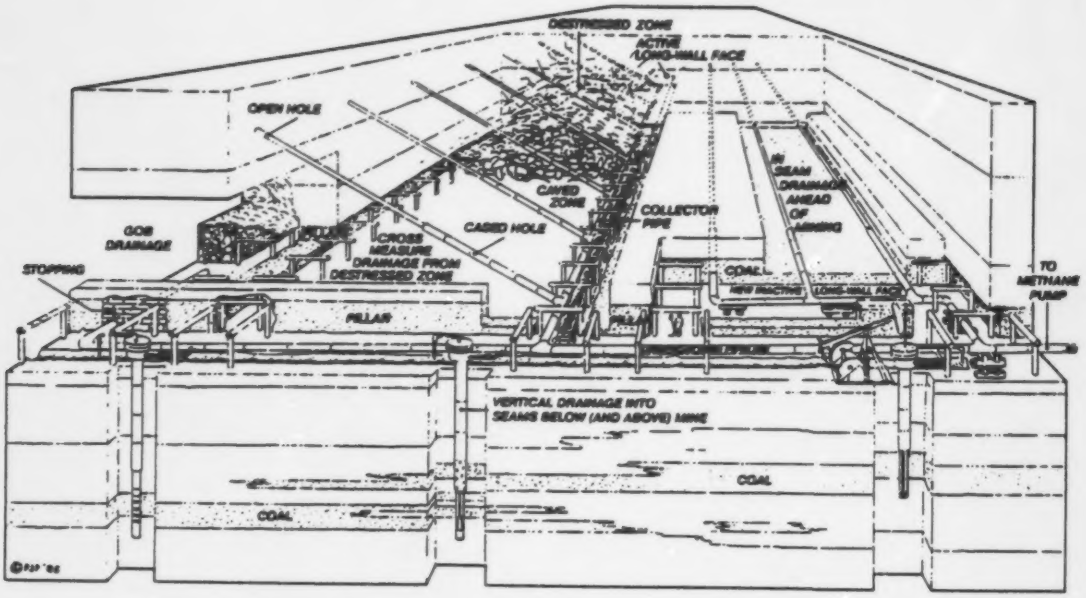
CH4 INTERNATIONAL LTD.

⑬

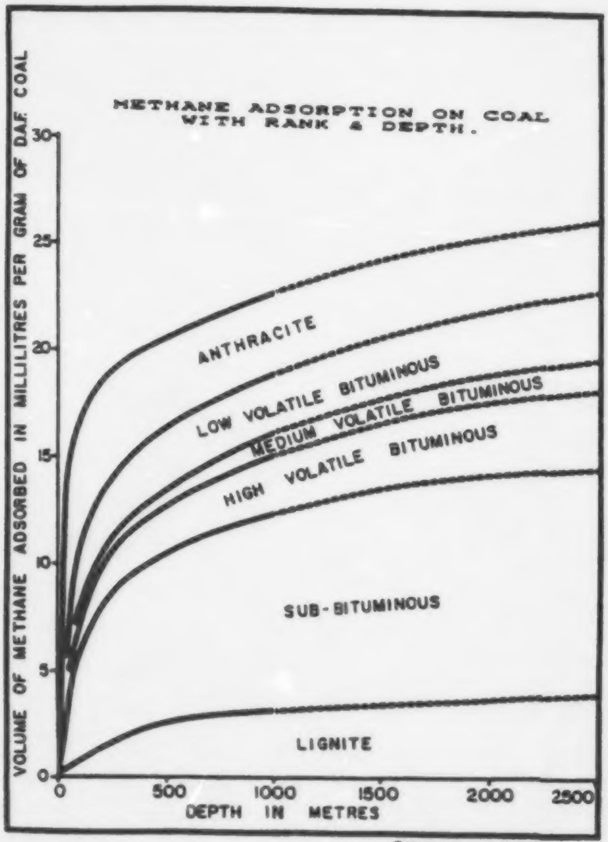
CH4 International Ltd.

888 - 48 Street, N.E.
Calgary, Alberta, CANADA
T2A 4L9
Telephone 1 (403) 273-6296

COAL MINE DRAINAGE SYSTEMS


DESTRESSED ZONE
ACTIVE LONG-WALL FACE
OPEN HOLE
IN SEAM DRAINAGE AHEAD OF MINING
CAVED ZONE
COLLECTOR PIPE
GOB DRAINAGE
CASED HOLE
CROSS MEASURE DRAINAGE FROM DESTRESSED ZONE
STOPPING
TO METHANE PUMP
COAL
NEW INACTIVE LONG-WALL FACE
PILLAR
PILLAR
VERTICAL DRAINAGE INTO SEAMS BELOW (AND ABOVE) MINE
COAL
COAL
©FJP '86

⑩



CH4 International Ltd.

Esso Resources Canada Limited

Esso

Esso Plaza
237 Fourth Avenue Southwest
Calgary, Alberta
Canada T2P 0H6

J. W. Pollock
General Manager

Environment and
Communications Division
Tel. 403 237 4039
Fax. 403 237 3611

January 11, 1991

Mr. N.E. MacMurchy
Alberta Energy
Sustainable Energy Development
10th Floor North Tower Petroleum Plaza
9945 - 108 Street
Edmonton, Alberta
T5K 2G6

Mr. K.R. Smith
Alberta Environment
Oxbridge Place
9820 - 106 Street
Edmonton, Alberta
T5K 2J6

Dear Sirs,

IMPERIAL OIL LIMITED'S SUBMISSION TO THE CLEAN AIR STRATEGY FOR ALBERTA (CASA)

The attached submission has been prepared as Imperial Oil's contribution to the CASA initiative. We view CASA as an important starting point for improving our collective ability to manage air quality in Alberta. The submission emphasizes the importance of the supporting processes and framework applied to management of air quality that will enable Alberta to effectively respond to current and future air quality challenges over the long term.

Recommendations outlined in the submission are intended to provide a basis for dialogue and discussion. In this regard, we would appreciate the opportunity to discuss the submission directly with you at your convenience. I will be contacting you in the near future to make appropriate arrangements.

If you have any comments or questions, please contact me at 237-4039 or Gord Lambert at 237-3872.

Sincerely,

Pollock

J.W. Pollock

GRL/mjes/Attachment

Copy: *Mr. R.H. Michell, Alberta Energy, Edmonton (10 copies)*
Mr. I. Burn, Alberta Energy, Edmonton
Mr. R.J. Hicks, Alberta Environment, Edmonton
Mr. H.S. Sandhu, Alberta Environment, Edmonton
Mr. R.J. Ottenbreit, Esso Resources, Calgary
Mr. G.R. Lambert, Esso Resources, Calgary

Imperial Oil

Imperial Oil Limited
Submission to the

Clean Air Strategy for Alberta

Esso
Imperial Oil

JANUARY 1991

Foreword

Imperial Oil Limited ("Imperial") is pleased to offer the following response to the provincial government's Clean Air Strategy for Alberta (CASA) initiative.

As a major producer of hydrocarbons, refined petroleum products and petrochemicals, Imperial has a significant operating presence in Alberta and Canada. Thus, we have an important stake in the development of public policies that address air quality issues.

In addition, Imperial is committed to helping meet the environmental challenges facing Albertans and Canadians. We have work under way to contribute to the further development of Canada's Green Plan, including a seven-point work program relating to potential global warming and discussion papers on air quality and economic instruments to achieve environmental objectives. Much of this work will have relevance for the Clean Air Strategy for Alberta (CASA).

A key theme that continues to permeate our thinking is the need to strike a balance between environmental concerns and economic priorities. We firmly believe that a strong economy provides the means of achieving improvements in environmental quality.

We welcome the opportunity to contribute to this commendable initiative and look forward to participating in the public debate that will lead us to a successful clean air strategy for Alberta.

JD McFarland

J. D. McFarland
Vice-President
Environment
Imperial Oil Limited

D Baldwin

D. D. Baldwin
President and
Chief Executive Officer
Esso Resources Canada Limited

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1. Introduction

Imperial Oil Limited is pleased to participate in the development of the Clean Air Strategy for Alberta (CASA). We are committed to helping find effective solutions to Canada's environmental challenges. And we believe that through papers such as our current CASA submission, our *Discussion Paper on Potential Global Warming* and our *Response to The Green Plan: A National Challenge* we are making a valuable contribution to this end.

Each of our contributions, although responding to a separate challenge, is based on guiding principles, which reflect lessons learned from the past and provide a framework for the future. Our guiding principles recognize that we, as a society, must:

- strike the balance between environmental and economic priorities
- search out the best thinking of all stakeholders
- enroll those closest to the problem to help find solutions
- apply sound science to define problems and guide solutions
- utilize market forces to evoke the creative talents of the private sector
- harmonize environmental legislation across the country to foster efficient and effective action
- seek global solutions to global problems, regional solutions to regional problems and local solutions to local problems

The comments and recommendations contained in this submission reflect our guiding principles. They also reflect our belief that by enhancing the quality and application of planning, decision-making and regulatory processes, we will be in a strong position to effectively manage air quality in Alberta *and* Canada.

2. Air Quality Management Priorities and Objectives

2.1 Defining Problems

Stakeholder consultation is essential to effective problem definition. Therefore, a key objective of the problem-definition process is to engage stakeholders in constructive dialogue that identifies and defines significant issues, concerns and problems.

Constructive dialogue, however, requires that stakeholders receive complete, accurate and relevant information that is presented in a meaningful way.

For example, to participate in a constructive dialogue about current and future emissions and their associated environmental implications, stakeholders require emissions inventory data showing total emissions of a particular pollutant (e.g., SO_2) assessed against levels associated with known or anticipated environmental impacts.

Imperial's experience with the OSLO project, where project activities and associated cause-and-effect relationships are presented schematically for stakeholder review and comment, demonstrates that constructive dialogue and successful problem definition are possible.

Recommendations

- *Ensure stakeholders receive complete, accurate and relevant information that is presented in a meaningful way. Ensure cause-and-effect relationships are identified.*
- *Where cause-and-effect relationships are not known, focus research efforts on addressing key areas of uncertainty.*

- *Ensure problem definition describes the dynamic elements contributing to current or future problems. For example:*
    - *population trends*
    - *ambient air quality*
    - *climatology*
    - *energy production and use patterns*
    - *economic development activity*
- *Include risk assessment as an integral element of problem definition.*

2.2 Setting Priorities

It is critical that we act cooperatively to make the most effective use of limited financial, human and institutional resources. As a society we recognize the need to improve environmental quality; thus, we cannot afford to take an unfocused approach that diverts our attention from the most significant environmental problems to those that are currently less important. This requires that we assign clear priorities to air quality problems and possible actions, and regularly test these against other environmental priorities.

However, the fact that resources are limited is often not explicitly recognized in the stakeholder consultation process. And it can be predicted that the number of environmental problems and possible solutions that will arise in any consultation process will likely require resources that exceed the level of resources available. In other words, before the consultation process even begins, we know that we will have to decide on the relative priority of problems to be addressed and actions to be taken to address them.

Therefore, the consultation process should initially focus on developing a clearly defined decision-making process that outlines specific decision criteria and their application for determining relative priorities. Ideally, those criteria would be established in consultation with stakeholders before debating issues and opportunities. That consultation would give stakeholders an understanding of how decisions are to be made, ultimately increasing their commitment to the final results.

Stakeholders must also understand that priorities are relative — not absolute. The process for establishing relative priorities must be dynamic, to respond to changing factors such as scientific knowledge, national and international initiatives, economic conditions, industrial development activity and international competitiveness considerations.

As factors change, priorities are revisited. Thus, items that are not a high priority today might be a high priority two years from now. And as higher priority items are addressed, efforts can be redirected to address lower priority items.

Recommendations

- *Emphasize that priority setting is a dynamic process that responds to the changing nature of factors influencing air quality management.*
- *As a prerequisite to debating issues and opportunities and in consultation with stakeholders, establish and rigorously apply a clearly defined decision-making process that identifies specific criteria and their application for determining relative priorities.*
- *Ensure priorities are clearly established at all times so that limited resources are directed to the highest priority problems.*
- *Revisit priorities periodically, in response to new knowledge, or as progress is made in addressing previously established high-priority problems.*

2.3 Setting Targeted Objectives

Many of the relatively low-cost, high-benefit opportunities for improving air quality have already been captured. For example, over the past 20 years in Canada, ambient concentrations of sulphur dioxide and carbon monoxide have decreased over 60 percent, suspended particulates are down over 40 percent and nitrogen dioxide is down almost 30 percent. We're making progress as measured by the National Air Pollution Surveillance Network.

However, future improvements will tend to have relatively higher cost for relatively smaller incremental benefits. Therefore, when establishing objectives, it is becoming increasingly important to consider economic implications in addition to environmental protection requirements. In other words, we must integrate environmental and economic considerations in air quality management.

Establishing pollutant- and problem-specific (i.e., targeted) objectives is necessary to facilitate air quality management in Alberta. Currently, however, our approach is to either set province-wide objectives and standards for ambient air quality or to set point-source emissions limits (generally based on emission rates). Neither mechanism directly acts to control total emissions loadings, which is key to minimizing adverse environmental effects.

An alternative approach is to assign pollutant-specific, total-loading objectives (often referred to as "caps") to address specific air quality concerns. Those could be targeted on a global, regional or local basis depending on the nature of the particular problem. This way of defining objectives focuses regulatory objectives on real current or future problems in the area they exist, which in turn leads to improved economic efficiency in addressing air quality problems.

Recommendation

- *Develop a formal process, supported by stakeholders, to select economically viable and environmentally substantiated and targeted objectives (e.g., pollutant specific, total loadings) in an optimum time frame and on an appropriate geographic basis to address specific problems. This process must include:*
    - *developing scenarios involving considerations such as:*
        - *alternative total loading targets*
        - *alternative time frames to achieve identified targets*
    - *assessing relative environmental benefits and risks*
    - *comparing and assessing economic implications (e.g., marginal costs associated with incremental benefits)*
    - *determining the technical feasibility of possible objectives*

3. Regulatory and Administrative Processes

3.1 Regulatory Framework

The use of air quality management zones provides a basis for spatially defining pollutant-specific air quality problems in relation to current or potential risk of environmental damage.

In the United States' new Clean Air Act, the air quality management zone concept is used to establish a cap on acid forming emissions. The cap focuses on the Ohio Valley and Northeastern United States because point sources are largely concentrated in those regions, and SO_2 and NOx total loadings from this collection of point sources are the critical factors in minimizing adverse environmental effects. It should be noted that the zone targeting approach does not arbitrarily recognize political (provincial, state or national) jurisdictional boundaries; rather, it recognizes specific problem areas.

Environment Canada, too, used this concept for the recent NOx and VOC Management Plan. In the Plan, the Quebec City-Windsor corridor is focused on as a "region" of concern within which specific zones will be targeted for specific actions.

This type of framework provides a focused basis for addressing air quality problems. In addition, the framework provides flexibility for responding to changing air quality concerns and is compatible with the concept of applying the most effective regulatory instrument(s) to a specific problem.

Recommendation

- *Adopt the use of air quality management zones that:*
  - *spatially define pollutant-specific air quality problems, based on the best available knowledge of:*
    - *sources, loadings*
    - *dispersion characteristics (spatial and temporal)*
    - *cause-and-effect relationships (ecological impacts)*
    - *risk and long-term trend assessments*
  - *are established, amended or deleted in response to new information or changing priorities*
  - *allow targeted objectives to be established on a zone-specific basis*

3.2 Regulatory Instruments

Air quality issues and associated command and control regulations to address those issues are increasingly complex, costly and interdependent. Thus, there is a need for government and industry to pursue additional flexibility and innovation in applying regulatory instruments to mitigate or eliminate air quality problems.

Alternative approaches to command and control mechanisms, such as tradeable emission rights, appear promising for achieving some desired environmental objectives in a more cost-effective way. Other economic instruments – including various incentives – have not yet been fully explored but may emerge as useful regulatory instruments. Instruments that act to channel market forces can be a powerful means of tapping the creativity of the private sector to achieve environmental objectives in the most cost effective way.

Recommendations

- *Develop flexibility in the types of regulatory instruments available so that the most effective instrument can be applied to achieve a specific objective.*

- *Incorporate a provision that explicitly acknowledges the existence of alternative approaches to command and control mechanisms including market-based approaches (e.g., tradeable emission rights) into The Alberta Environmental Protection and Enhancement Act. The provision should provide the Minister with the authority to adopt alternative instruments where appropriate.*

- *Structure regulations related to regulatory instruments so that environmental effectiveness is ensured in the most cost effective way (i.e., minimize regulatory complexity).*

3.3 Monitoring and Reporting

The full benefit of air quality data currently being collected is not being realized. The primary use of data submitted currently is to determine compliance. While this is an important objective of air quality monitoring and reporting, it should not be the sole objective. Instead, we should focus on using air quality data more effectively to support air quality management.

Currently, stakeholders receive inadequate feedback about air quality trends that, if available, could be used to encourage positive behaviour and support decision making at all levels. In addition, increased effort must be placed on scientific analysis and assessment not only related to the nature of emissions but also to causes and effects.

Recommendations

- *Use air quality monitoring to:*
  - *contribute to a better-informed public*
  - *test for compliance with appropriate regulations and standards*
  - *collect, compile and report data that supports air quality management (e.g., updated emissions inventories, trends)*
  - *support scientific research on key air quality issues*
  - *provide timely feedback to the public and industry on current status of air quality and progress in meeting targets and objectives*

- *Develop a partnership among industry, government and the public to support air quality monitoring.*

- *Ensure cost effective use of resources among all stakeholders in efforts related to monitoring and reporting.*

- *Develop and apply improved management and assessment tools (e.g., dispersion and airshed models).*

- *Consolidate organizational responsibilities for managing air quality information, including researching, monitoring, reporting and analyzing.*

3.4 Consultative Decision Making

Affected stakeholders must be consulted throughout the decision-making process to ensure economic and environmental implications are fully understood and assessed.

A consultative decision-making process not only ensures better quality decisions, it increases stakeholders' commitment in the ultimate decision and its implementation.

Recommendations

- *Make decisions using processes and criteria established in consultation with the broad-based public.*

- *Ensure decision-making processes recognize both economic and environmental implications.*

- *Use a consultative decision-making process to develop and maintain an air quality management framework that would:*

    - *define priorities*

    - *define air quality management zones where appropriate*

    - *establish targeted objectives within those zones*

    - *specify the most appropriate regulatory mechanisms to meet specific objectives*

- *Provide Alberta Environment with the responsibility for developing and maintaining the framework using a consultative approach to problem definition and decision making.*

- *Ensure the consultation process includes Alberta Energy, Energy Resources Conservation Board, Alberta Health, industry, the scientific community and directly affected members of the public.*

- *Communicate decision-making reasoning to stakeholders.*

4. Summary

The Clean Air Strategy provides an opportunity to consider how Albertans can most effectively manage air quality over the long term. The recommendations outlined in our submission represent Imperial's view of how this might be achieved.

The anticipated benefits of these recommendations are that Alberta would:

- integrate economic and environmental considerations
- be responsive to change
- effectively allocate limited resources

Together, these benefits translate into an overall improvement in our ability to maintain and, where necessary, enhance air quality for all Albertans. They also enable the province to fulfill its commitment to address the broad spectrum of air quality issues inside and outside its boundaries.

Our Commitment

Imperial is committed to working with stakeholders to explore and develop the recommendations outlined above. We will continue to provide the company's unique perspective, together with information and analysis from our operations and activities, to support provincial initiatives.

In addition, Imperial is committed to providing sound information through monitoring and reporting of air emissions associated with our operations and to assist in developing an improved understanding of their environmental impacts.

Electric Utility Planning Council

Management Committee
Alberta Power Limited
Edmonton Power
The City of Calgary
TransAlta Utilities Corporation

February 1, 1991

Mr. Bob Mitchell,
Clean Air Strategy for Alberta,
Bag 1, Mail Room,
Main Floor, North Petroleum Plaza,
9945 - 108 Street,
Edmonton, Alberta.
T5K 2G6

Dear Mr. Mitchell:

Attached please find a copy of the Electric Utility Planning Council's submission to the Clean Air Strategy for Alberta. The Electric Utility Planning Council views the Clean Air Strategy for Alberta as an important initiative and looks forward to continued participation in the spring workshop and subsequent public discussions.

Our submission briefly describes the contribution already made by the electric utilities to air quality management in Alberta; identifies consumer and utility opportunities to manage air emissions; and proposes steps we can take together to move the Clean Air Strategy forward. An agenda for the future is proposed to overcome, in particular, the regulatory issues affecting environmental management.

The Electric Utility Planning Council's submission is made with the expectation that it will contribute positively to management of air quality issues in Alberta. We welcome any inquiries you may have concerning our submission and look forward to working with you to move the Clean Air Strategy forward.

Yours truly,

G.M.Steeves,
Chairman,
Management Committee.

PDL/kh
Attachment
c.c. Mr. Norm MacMurchy
Mr. Ken Smith

"Providing co-ordinated planning for future electrical needs in Alberta"

Clean Air and Alberta's Electric Utilities

a submission to the

Clean Air Strategy for Alberta

January 1991

Electric Utility Planning Council

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- *Climate change and acid rain*
- *Research and development initiatives*
- *Information and educational efforts*

A concluding word 19

Electric Utility Planning Council

Alberta Power Limited
Edmonton Power
TransAlta Utilities Corporation
City of Calgary Electric System
City of Lethbridge
City of Medicine Hat
City of Red Deer

Introduction

The Clean Air Strategy for Alberta (CASA) process is one important element of a continuing effort to address clean air-related issues in the province. Coming to grips with environmental challenges is a multi-stage process including:

- The precise identification of a current or prospective problem;
- The delineation of contributing factors;
- The identification of barriers that affect the ability to address an issue;
- The assessment of available approaches to deal with particular issues including a consideration of relevant social and economic impacts of alternative strategies;
- The establishment of achievable objectives within a realistic time frame;
- The development of a suitable framework that will allow and encourage all parties to assume their respective responsibilities;
- The establishment of reliable means to measure progress in meeting an identified objective.

The efforts identified above require thoughtful consideration and an appropriate sharing of responsibilities. Regulators, in consultation with electric utilities and stakeholders must establish appropriate environmental objectives. Industry and electric utilities, in particular, must be given the flexibility to devise appropriate technical and other approaches to meet an identified objective.

At all stages of the environmental decision-making process, electric utilities and stakeholders must be involved. Dealing with environmental challenges is an integral part of the electric utility business. As such, utilities have a keen understanding of many of the practical considerations involved in pursuing responsible environmental policy and management.

The main purpose of this submission is to identify a number of specific issues and some proposed approaches that will ensure the regulatory system provides needed flexibility to meet environmental challenges in a focused and responsible fashion.

This brief provides some background information about the electric utility industry in Alberta, the air-related impacts of electrical generation, some efforts that have been undertaken to reduce emissions and current options under consideration to minimize future impacts. An outline of principles to guide regulatory initiatives is offered, as is an agenda for future action.

I. Industry Background

Electricity in Alberta is generated and distributed by two investor-owned companies, TransAlta Utilities Corporation and Alberta Power Limited, as well as two municipally owned utilities, Edmonton Power and the City of Medicine Hat. The cities of Calgary, Red Deer and Lethbridge distribute electricity within their municipalities. In addition, there is some limited non-utility generation in the province.

Because planning a major electric generation project and bringing it on stream requires a long lead time, it is important to predict future energy demand as accurately as possible.

In 1972, utilities in Alberta established the Electric Utility Planning Council (EUPC) to coordinate planning for future electrical needs. Every year, the EUPC produces a range of electric energy and demand forecasts reflecting various possibilities for economic growth in Alberta.

II. Air emissions by electric utilities

As a result of an available abundance of fossil fuels, about 85 to 90 per cent of all electricity in Alberta is produced by seven coal-fired generating stations. The remainder of the province's electrical needs are met by natural gas, hydro and diesel-driven technologies.

In the process of generating electricity from coal-fired facilities, flyash, sulphur dioxide (SO_2), oxides of nitrogen (NOx), carbon dioxide (CO_2) and water vapor are produced.

Over the past two decades, electric utilities have made major strides in reducing emissions from coal- and gas-fired power plants to meet provincial and federal standards. To date, standards for CO_2 have not been established. The issue of climate change and CO_2 will be discussed in subsequent sections of this submission.

A number of natural advantages and technological advances have enabled Alberta's utilities to responsibly manage air emissions:

Abundant, available low-sulphur coal

Alberta has an abundance of accessible, low-cost, low-sulphur coal that ensures sulphur emissions from coal-burning generating units are low.

Improvements in boiler design

Improvements in both coal and natural gas-fired boiler design have resulted in significantly reduced emissions of oxides of nitrogen and have enabled utilities to extract more kilowatt-hours of electricity from a unit of fuel.

High efficiency dust removal systems

Over the last 20 years, the efficiency of removing flyash from stack gases has increased from less than 85% to 99.5%.

III. Future options

The challenge facing the electric utility industry is to satisfy the needs of customers while ensuring that environmental impacts are minimized.

Among the options to reduce air-related impacts are:

- Making more use of energy efficiency and conservation measures by utilities and customers;
- Participating in the development of new pollution abatement and electric generation technologies;
- Using alternative energy sources and technological options.

Potential energy efficiency measures

Conservation

Government and industry studies indicate that residential, commercial and industrial efforts can play an important role in reducing consumption of energy. These demand-side management measures do not, however, have the same potential for the electric industry as in other provinces due to the use of natural gas for most of Alberta's heating requirements. Further improvements in the efficiency of electricity generation, transmission and distribution can also result in reduced emissions.

Electrotechnologies

Variable Speed Drive motors installed on industrial equipment allow oilfield operations, for example, to meet variable power needs and reduce electricity consumption. Other examples of electrotechnologies with potential to increase energy efficiency include the use of electric furnaces in steel making and high efficiency electric drives.

Cogeneration

Heat is produced as a by-product when electricity is generated or as a result of other industrial proceses. Waste heat produced by utilities can be captured to provide useable energy. As well, heat produced as a result of manufacturing, processing and other industrial activities can be used to generate electricity. Both processes are known as cogeneration. One example under consideration is district energy.

In Alberta, there is considerable potential to use cogeneration technologies as a means of increasing energy efficiency and reducing emissions.

Potential technologies to reduce air emissions

Alberta utilities are involved in a variety of initiatives in the province and through the Canadian Electrical Association to test new emission prevention and abatement measures. The efforts include:

- *Testing of coal burning technology that significantly reduces sulphur dioxide and oxides of nitrogen*

  Alberta utilities are taking a lead role in the testing of a low NOx - SOx burner in Cold Lake.

- *Assessing various processes to reduce sulphur emissions*

  Alberta utilities are monitoring flue gas desulphurization technology such as fluidized bed combustion and sorbent injection.

- *Assessing the use of coal gasification to reduce emissions*

  Alberta utilities, through the Coal Association of Canada, are currently examining the feasibility of testing an Integrated Coal Gasification Combined Cycle (IGCC) unit that may reduce emissions.

- *Assessing other processes to further reduce emissions*

  The use of gas turbines with steam injection is being evaluated to control NOx emissions. As well, utilities are supporting efforts to improve energy efficiency with emerging technologies such as fuel cells.

- *Research into CO_2 extraction and disposal technologies*

  Alberta utilities are participating in research and technology development for CO_2 extraction and disposal through such efforts as enhanced oil recovery schemes.

Potential energy sources

Wind, hydro, solar power, biomass, energy recovery, landfill gas utilization, nuclear and power purchases from utilities outside Alberta and independent producers may well come to play a more important role in meeting electric power needs in the future.

IV. Principles to guide regulatory initiatives

The regulatory system plays a crucial role in determining how environmental challenges are to be tackled. Governments and regulatory bodies should work with industry and concerned stakeholders in a coordinated and cooperative fashion. In this way, a realistic environmental agenda will emerge. Such an agenda should incorporate a suitable division of tasks and responsibilities to meet mutually acceptable and achievable environmental targets.

As noted earlier, the most effective way to ensure environmental challenges are addressed effectively, is for government, regulatory bodies, industry and concerned stakeholders to agree upon suitable environmental objectives concerning identified environmental problems. Such an approach should not see government or regulatory authorities impose specific solutions on industry or consumers. In order to ensure that the most appropriate solution is adopted in a cost-effective manner to meet a particular environmental challenge, it is crucial that the regulatory framework allows for flexibility of response.

The EUPC suggest the following principles should be considered in regulatory relationships with respect to environmental matters:

1) Consultation with concerned parties

As part of developing legislative or regulatory standards, there should be adequate and open consultation with scientific, industrial, consumer and community interests. The EUPC supports the approach used in developing the NOx/VOC management plan and the consultative processes that led to the development of the Canadian Electrical Association - Environment Canada Code of Practice for steam electric generating stations.

2) A need for realistic targets

Environmental objectives including emission targets must take into account what is in fact achievable within a given time frame in light of available technology, the social and economic costs of meeting particular standards and the environmental impact of available alternatives. The environmental agenda should focus on bona fide concerns such as activities that harm human health or jeopardize the ability of the ecosystem to absorb environmental impacts.

In Alberta, environmental problems vary regionally. Some areas of Alberta, for example, are more susceptible to acid deposition than others. As such, it is appropriate to establish regional targets that reflect local conditions. Broad-brush targets that do not, in effect, relate to an identifiable problem in a particular region result in wasted efforts that are costly to consumers.

3) A comprehensive approach to regulation

Environmental initiatives cannot be taken in a piecemeal fashion. Regulatory measures that result in the reduction of emissions of one substance must avoid causing an increase in the emission of another, more detrimental pollutant. It would be undesirable to devise a solution to an air quality concern only to cause a difficulty with solid waste management. For example, sludge created as a result of flue gas desulphurization should not result in undesired land-related impacts or increases of other air emissions.

4) Consistency and coordination

Environmental standards, enforcement and reporting requirements should be coordinated between federal and provincial jurisdictions. Competing or inconsistent regulatory regimes result in planning uncertainty. Duplication of environmental reporting requirements imposes an unnecessary administrative burden on industry and increases costs to consumers. A one-window approach to environmental monitoring and reporting is the most effective approach.

5) Flexibility, practicality and innovation

The regulatory climate has a direct bearing on the degree of flexibility available to industry and consumers to meet environmental objectives. Efforts to foster flexibility of response include:

- Encouraging the use of market forces where appropriate to foster environmental innovation and entrepreneurship;

- Encouraging approaches that make economic sense in their own right (such as some consumer conservation efforts) while priorizing other approaches on the basis of their environmental effectiveness per dollar of value;

- Encouraging a staged approach to dealing with major environmental measures.

6) *Prevention of future problems*

Over the years, Alberta utilities have invested substantially in pollution abatement technology to meet and surpass federal and provincial air emission standards. At present, the province's air quality is generally considered to be good. Prevention of future problems should be achieved by allowing utilities the flexibility to meet air quality goals in the most cost-effective manner. In the absence of scientific evidence that supports the existence of regional air quality problems, new source performance standards should be confined to future plant approvals.

V. An Agenda for the Future

Efforts to protect air quality in Alberta will be enhanced if additional attention is devoted to four subject areas:

1) Regulatory and policy barriers

2) Climate change and acid rain

3) Research and development initiatives

4) Information and educational efforts

1) Regulatory and policy barriers

In some instances, policy and regulatory uncertainty impede efforts to pursue certain emission reduction alternatives. The following list (not in any particular prioirity) includes barriers created by the Alberta system and possible measures to mitigate them. This brief does not present detailed solutions. Rather, the EUPC hopes that in due course, regulatory authorities will devise more detailed policy in concert with utilities and stakeholders. The long-term intent is to ensure the regulatory environment is sufficiently flexible to encourage a range of alternative responses to environmental challenges.

A) Issue requiring attention: **Uncertainty concerning environmental regulation**

There is a lack of clear rules regarding the environmental regulatory approval process, especially with regard to environmental impact assessments.

Desired outcome

- Federal and provincial roles in the environmental regulatory process should follow a one-window approach in order to avoid duplication.

- Regulations concerning the Alberta Environmental Protection and Enhancement Act governing environmental impact assessments should provide a reasonable level of certainty with regard to timing and closure. EIA requirements should be comprehensive and include appropriate timelines for completion, and regulatory decisions should be definitive.

B) Issue requiring attention: **Uncertainty following environmental approvals**

In the Alberta Environmental Protection and Enhancement Act, there is a proposed provision that conditions in an environmental approval to construct can be altered at any time. This creates uncertainty and lowers the value of an approval in the eyes of potential investors.

Desired outcome

Consideration should be given to addressing this concern before the legislation is finalized.

C) Issue requiring attention: **Clarification of regulatory roles**

In some instances, it is uncertain whether a regulatory approval by one regulatory body will be upheld or altered by another.

Desired outcome

Efforts should be undertaken to clarify and streamline the roles of Alberta Environment, the Alberta Energy Resources Conservation Board, the Alberta Public Utilities Board and the Natural Resources Conservation Board as they concern environmental approvals.

D) Issue requiring attention: **Clarification of air emission objectives**

There is a need to delineate specific clean-air objectives for the province as a whole and on a regional basis. The clarification of such objectives would focus attention on appropriate action.

Desired outcome

Efforts which would be consistent with establishing air quality objectives include:

- The development of an air quality index for the province;
- The finalization of regional acid deposition targets;
- The development of appropriate targets for CO_2 emissions in consultation with industry and stakeholder groups.

E) Issue requiring attention: **Incentives to encourage environmental initiatives**

In order to encourage environmental initiative, appropriate incentives should be examined by regulatory authorities and concerned stakeholders. Suitable incentives will stimulate innovation and ensure environmental costs are integrated into decision-making.

Desired outcome

Among some possible incentives worthy of further examination are:

- Measures that ensure equitable Alberta Public Utilities Board treatment of environmental initiatives which encourage utilities to surpass standards;
- The use of tradeable emission permits;
- Provision for the immediate banking of credits for emission reductions below current standards against future emission requirements;
- Basing new source emission standards on the amount of useful energy produced rather than the amount of a resource consumed in the production of electricity. This will encourage further energy conversion efficiency.

F) *Issue requiring attention:* **Establishing conservation and energy efficiency programs**

Clear conservation targets and timelines should be delineated for the province in consultation with concerned parties. Such an effort would complement a clean air strategy.

Desired outcome

Among measures that would complement conservation and energy efficiency programs are:

- Favourable treatment by the Alberta Public Utilities Board of investment in conservation and energy efficiency measures;
- The support of Canadian standards for energy efficiency in buildings, motors and lighting.

G) Issue requiring attention: **Clear rules for DSM investment**

There is a lack of clear direction concerning the treatment of electric utility costs for investment in Demand-Side Management (DSM) measures which conserve energy. The rules regarding the treatment of DSM measures are emerging on a piecemeal basis.

Desired outcome

It is recommended that government departments and the Alberta Public Utilities Board move quickly to address this issue in consultation with the electric utilities and other key stakeholders.

H) Issue requiring attention: **Guidelines for cogeneration**

Recognizing the potential for environmental benefits associated with cogeneration, there is a need to establish guidelines for industry and electric utility cogeneration projects.

Desired outcome

Stakeholders and concerned parties should develop appropriate guidelines to foster the development of cogeneration projects.

I) Issue requiring attention: **Reconsideration of provincial fuel use policy**

Currently, provincial policy directs that coal-fired plants be used for base load electricity requirements.

Desired outcome

The alternative of using natural gas-fired plants to meet base load requirements should be assessed as one possible means of meeting certain environmental objectives.

J) Issue requiring attention: **The treatment of major capital-intensive projects**

The current regulatory approach to cost recovery concerning capital-intensive projects (such as hydro projects), is a barrier to their consideration in meeting electricity needs.

Desired outcome

Innovative financial and Alberta Public Utilities Board terms should be identified and assessed to make major capital-intensive generation projects financially attractive.

2) Climate change and acid rain

CO_2 and climate change

Carbon dioxide (CO_2) emissions are being raised as a concern in connection with climate change. While thermal generation from coal and gas is currently the most economic option for generating power in Alberta, there is currently no practicable, commercially available technology for disposing of CO_2 produced during combustion.

There are, however, a number of positive steps which can be undertaken so that global warming concerns are addressed responsibly:

- Alberta should negotiate an appropriate federal-provincial CO_2 emission control agreement that is realistic and achievable, recognizing the relative contribution of Alberta and Canadian emissions to global warming. Such an agreement should ensure that the province's social and economic well-being is not adversely affected.

- An appropriate research agenda developed in concert with industry, universities and governments should focus on achieving greater efficiency in all stages of electrical production, transmission, distribution and use. Suitable measures should be assessed to encourage the development of technologies that capture and dispose of or utilize CO_2.

- Financial and technical support should be made available to developing countries to encourage the transfer of technology to deal with the emission of greenhouse gases.

Acid rain

One of the concerns regarding the emission of sulphur dioxide and oxides of nitrogen is that they may lead to acid rain. The Acid Deposition Research Program (ADRP) reported in 1988 that acid gases were not harming the Alberta environment. The three-year study also said that some areas of the province could be susceptible to acid deposition and suggested monitoring efforts should continue.

Efforts to ensure that acid deposition problems do not emerge should include attention to the principles and regulatory issues noted in this brief. In this way, appropriate and cost-effective measures can be undertaken to prevent acid gas-related problems.

3) Research and development initiatives

Since there is an abundance of low-sulphur, sub-bituminous coal in Alberta, a research agenda should include efforts to enhance the development of clean coal technology. Cost sharing of research efforts and field testing in Alberta of technology developed abroad would enhance clean air efforts in the province. As noted, further efforts are necessary to develop technology to remove CO_2 from combustion processes and find appropriate disposal techniques.

4) Information and educational efforts

Information about the province's environmental status must be communicated to Albertans in a regular, comprehensive and comprehensible fashion. In this regard, the proposed State of the Environment report mentioned in the Alberta Environmental Protection and Enhancement Act is a worthwhile endeavour. Additional use of information gathered by the utility industry about ambient air in the vicinity of plant operations could assist the dissemination of information to the public.

Consumers must have access to useful information that will allow them to make wise decisions that positively affect the environment. Further attention is necessary to coordinate communication efforts by government and industry concerning consumer conservation efforts. Additional attention should also be devoted to incorporating environmental education in school curricula.

A concluding word

This submission has outlined a number of alternative approaches to maintaining clean air in Alberta. In order to pursue technological solutions, conservation-based approaches, alternative energy options or a combination of these and other measures, some changes to the regulatory framework should be thoroughly discussed.

With an appropriate regulatory framework in place, industry, consumers and stakeholders can build on efforts already undertaken to safeguard the environment.

This brief provides a menu for future discussion. The EUPC and its member utilities look forward to participating in further efforts to advance the Clean Air Strategy.

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CU REPROGRAPHICS

SUBMISSION

BY

THE CANADIAN CHEMICAL PRODUCERS' ASSOCIATION

TO THE

CONSULTATIVE PROCESS ON

CLEAN AIR STRATEGY FOR ALBERTA

(CASA)

October 29,1990

The Canadian Chemical Producers' Association (CCPA) represents over 70 member companies producing a broad range of petrochemicals, inorganic chemicals and specialty chemicals. Total output of these industrial chemicals and synthetic resins amounted to approximately $11 billion, of which over 90 per cent came from member companies' operations in Canada. The industry employs about 25,000 persons throughout Canada and is highly trade oriented. Membership is attached at Appendix 1.

GENERAL STATEMENT

The Canadian chemical industry owes it to Canada to behave in an environmentally responsible manner. The Canadian Chemical Producers' Association, on behalf of its member companies, accepts that responsibility and commits to the responsible development, introduction, manufacture, transportation, storage, handling, distribution, use and ultimate disposal of chemicals and chemical products in a manner which minimizes adverse effect on human health and well-being and on the environment.

The merging and interdependence of economic and environmental objectives, considered crucial by the Brundtland Commission, implies that environmental considerations cannot be the sole pre-occupation and preserve of groups of environmentalists, nor should economic considerations be the sole pre-occupation and preserve of groups of industrialists, and nor should all the final decisions be the sole pre-occupation and preserve of groups of government officials and politicians. To proceed in this way means that all parties, environmentalists, industrialists and officials, become excessively protective of their own interests, confrontational vis-a-vis the interests of others and gains towards the objectives are only achieved through regulatory approaches that require intensive enforcement. Such an approach shows no net gain for society and is wasteful of efforts for all parties concerned and leads to growing dissatisfaction, disaffection and even a siege mentality which can only produce negative results for the country.

The countries which will rise above others in the future will be those which will have achieved an orderly transition to a solid, environmentally sustainable, long-term economic development. In order to achieve such an objective, attitudinal change and cooperation on the part of all stakeholders, including government will be essential. The eventual plan of action that will emerge from the current round of consultations will need to promote:

- the sharing and merging of specific environmental/economic goals by all parties
- personal and individual commitment and actions
- a focus on those problems which are the most crucial, with priorities based on sound scientific principles
- a focus on solutions which will have the desired impact, as defined jointly by the interested parties
- solutions which rely on a balance of personal initiative and a regulatory framework.

When stated as general principles, the above have a tendency to sound like motherhood statements. However, their application to specific issue areas will be crucial to making progress towards the overall objective of environmentally sustainable economic development.

It will be the role of the Provincial government to ensure that, as it evolves its consultation and action plan, it does so in a manner consistent with the above principles. It should also seek the commitment of the interested parties to these same principles.

- The Role of CCPA

For its part, The Canadian Chemical Producers' Association commits itself to acting in line with the principles enunciated above:

1. The CCPA and its member companies through their proactive Responsible Care initiative are committed to raising awareness about environmental sustainability and promoting responsible handling of chemicals throughout their life cycle. This applies not only to their operations, but also to that of others who handle these chemicals. Responsible Care consists of:

    - individual commitment to guiding principles by CEOs on behalf of their companies
    - a set of codes of practice screened by a group of community activists and endorsed by the full membership
    - mutual help and sensitization in achieving conformance amongst association members
    - public scrutiny of both process and progress

This initiative has been recognized as a responsible and positive approach by both Environment Canada and the United Nations Environment Program.

2. The CCPA and its member companies are committed to identifying issues and their solutions in a cooperative partnership with all other interested parties. The CCPA has clearly demonstrated this commitment through positive participation in consensus building consultations ranging from development of the Chemical Hazard Regulations through to input into the Environmental Law Enforcement Report and membership of the CASA Advisory Group.

o The role of Provincial Government

For its part, the provincial government must commit itself to:

1. Meaningful consultation involving all interested parties. Such consultation, to be meaningful, implies:

   o early consultation on defining the problem

   o ongoing consultation on identifying options for effectively solving the problems as well as the impacts on the various parties involved

   o final consultation on the legislative and regulatory instruments that may be required.

2. Promoting a partnership or consensus approach as the preferred route for consultation, along the lines of the Niagara Institute consultation protocol which had been agreed to by all parties.

3. Using legislation and regulations as safety nets to ensure an acceptable level of results by all, but placing increasing reliance on voluntary actions by non-government elements. This implies that government should give moral support to pro-active initiatives of the private sector.

4. Interdepartmental coordination which effectively integrates and balances the environmental and economic aspects of the issues and their potential solution, in order to achieve a net positive gain for society as a whole. Not to do must imply outright acceptance of sub-optimal results.

o The role of Environmental Groups

For their parts, environmental non-government organizations must commit themselves to:

1. Raising the environmental awareness of the other parties on an ongoing basis in a manner which will promote a more cooperative and less adversarial approach to resolving issues.
2. Support multi-partite partnerships aimed at identifying issues and their nature as well as integrative solutions which meet the test of environmentally sustainable development.
3. Assist private sector efforts in developing proactive initiatives aimed at effectively solving the issues.

As stated earlier, the nature of issues in the environment area bring to focus a variety of societal objectives. It is incumbent on all interested parties to seek integrated solutions as envisaged by the concept of environmentally sustainable economic development proposed by the Brundtland Commission. Failure to do so will undoubtedly result in failing our children in their long-term economic, environmental and health well-being.

THE INTERNATIONAL CHALLENGE

We particularly wish to discuss the challenges facing Alberta within the international context. This international element represents a challenge both in terms of economics and the environment.

Globalization has been the order of the day for many industries, and even more so, for the chemical industry where the test of severe competition is having to be met in both domestic and international markets. Approximately one third of all Canadian production is destined for exports while a similar percentage is imported to meet Canadian demand. Alberta does not have many competitive edges over production in other countries, in fact, availability of resources is one of the few natural ones. On the other hand, market size does create disadvantages. The balance between these is delicate.

The concept of environmental sustainability does bring focus on intergenerational equity which means an appropriate balance between today and tomorrow. Our children will not thank us for having created economic chaos for them any more than they will thank us for having created environmental chaos. That is why the words "orderly transition" are so important in the overall objective proposed earlier.

There can be no doubt that our actions and operations must be carried out with environmental awareness. To do otherwise is bad business. Our Responsible Care initiative is noted as a credible effort in this direction. We recognize equally that pollution prevention pays off economically in the long-term. Short-term dislocations could result, however, in losing our competitiveness and not being able to capture the long-term economic benefits for Canada.

Another aspect is important to consider here. If the Albertan regulatory framework is such that certain products can no longer be made competitively in Alberta, the products will still be made somewhere in the world for Albertan and Canadian consumption unless Albertan and Canadian demand changes. In particular, the products could be transformed into final products outside Alberta and Canada and be imported having bypassed the full Albert and Canadian production cycle and the regulatory regime. As an example, paint ingredients and paint could be subject to regulatory controls which make it uneconomic to make or even use them in producing Canadian cars. If other countries do not follow suit, it will be much easier and cheaper to import finished painted cars into Canada, if people still demand them.

This leads to concern about the way in which leadership by Alberta should be exercised on environmental issues and their solutions. Leadership can be practised by taking unilateral action or it can be exercised by prodding everyone forward. The former can create serious dislocations and possibly curtailment of Albertan operations, creating economic disorder while the latter can bring about necessary changes in a smoother transition with considerably more impact.

It is recommended therefore that Alberta demonstrate environmental leadership by forming partnerships with affected industries and interested environmental groups to obtain consensus on environmental issues. Hence a Provincial viewpoint can be presented to the rest of the Country through intergovernmental agencies (such as CCME) and be considered when arriving at a Federal viewpoint for inclusion in international agreements. This assumes that appropriate consultation will have taken place within both Alberta and Canada along the lines described in the general statement section to achieve agreed solutions.

The Canadian Chemical Producers' Association commits itself to play a positive role within such initiatives and has, in fact, displayed international leadership through its Responsible Care initiatives which it has promoted internationally. It is now being adopted by numerous other countries including the U.S., Australia, France and the Netherlands. This leadership has recently been given recognition by the United Nations Environment Program. A number of its companies have also participated actively with government in international activities such as development of the Montreal Protocol and ongoing work in the area.

The remainder of this presentation addresses specific issues under the following headings:

- Better Science
- More Information about the Environment
- Education
- Legislation and Regulation
- Economic Instruments
- Strengthening Partnerships
- The Health Dimension
- Global Warming
- Ozone Depletion
- Air Quality and Toxic Air Pollutants

SPECIFIC ISSUES

The basic principles discussed in the foregoing sections provide the necessary underpinning for achieving appropriate decisions on specific issues. There are therefore recommended as the privileged approach to dealing with any issues that will be discussed herein.

BETTER SCIENCE

Considerations

- The scientific community has a responsibility to Alberta to provide objective consensus of scientific realities as an appropriate basis for the rest of the province to make judgements. It must assist with the definition of worthwhile targets as well as facilitating innovative solutions. To perform this role adequately it must seek ways of bringing together representatives from government, academia, ENGOs and industry. We must recognize that "good science" may not exist in some areas. We must still use it however to the maximum extent possible to manage uncertainty.

- While CCPA can support the need for an increased commitment to environmental science and technology, there is an equal need to develop criteria whereby priorities can be established. Some of these could be:

    - urgency created by impacts
    - seriousness of the impacts
    - dove-tailing with federal and international efforts

  It will be important to remember that more science is not necessarily better science.

- There is a need to develop further excellence in toxicology in Alberta. At the moment this area is not adequately coordinated nor are there sufficient resources available to produce required studies. Additionally, there is a need to increase the supply of toxicologists.

  The concept of "Networks of Centres of Excellence" as developed by Industry, Science and Technology Canada would appear to have validity for the toxicology area, bringing together, as it does government, academia and industry in a focused and coordinated manner. There is a need however to develop strong nodes around which the coordination will be established. Earlier effects were promised industry support, notably the establishment of the Guelph/Toronto Canadian Centre for Toxicology and a proposal for a Network of Centres of Excellence in Toxicology. Neither of those have received federal government support.

Industry has offered its support on the condition that:

- governments also confirmed their support in order to ensure that the public would perceive the operations as objective.
- there would be an overall Canadian approach to get away from duplication and regional rivalries, and provide the necessary critical mass.

Recommendations

Government should establish an advisory board or similar operation under a single lead agency, to establish clear priorities for funding scientific research. Such a board should include representatives from governments, ENGOs, academics and industry. Emphasis should be on the practical application of science.

MORE INFORMATION ABOUT THE ENVIRONMENT

Considerations

- There is already much information available about the environment. In fact, a considerable amount of it is confusing and contradictory. More information therefore might simply compound the problem. Any effort in this area should be directed towards increasing the objective interpretation of available information. In order to do this, the exercise could be fed by multi-partite scientific groups as described in the previous section on "better science". Additionally, the presentation of the information is also crucial to creating proper and balanced understanding of the issue. A multi-partite communication group could advise on how best to communicate the information.
- It is recognized that environmental information must be available to all Albertans. Rather than spending much effort in bringing everything together in a centralized system, it would be better to focus on assembling information wherever information on various subjects is already available in Alberta and develop the means of accessing that information, whether electronically or otherwise.

Recommendations

- Before proceeding further, a task force should be assembled to assess what institutional changes are necessary to ensure how to better disseminate information, how to identify gaps in information and how to fill gaps in an objective manner. The aim should not necessarily be more information but better information. Such a group should consist of both the scientific community and communicators, and have representatives of governments, ENGOs, industry and the media.
- The Government should concentrate on developing a system to access available information rather than develop a centralized source. In addition, support should be given to the efforts of the Canadian Chamber of Commerce in developing an Environment Bureau to facilitate access to information for smaller businesses.

EDUCATION

(The comments are more fully developed at Appendix 2.)

Considerations

- The educational system must provide a balanced approach to the presentation of information.
- Utilize existing partnerships or instruments rather than creating new bureaucracies.
- Give recognition to other channels of information, such as the media.
- Build on the Green Plan recommendation of "good decisions require good information".

Specific examples of how the CCPA is involved include "Knowledge of Environment for Youth" (KEY) Foundation (formerly SEEDS Ontario) and the Foundation Riou-Delorme in Quebec. These efforts focus on providing a balanced information background for teachers in primary and secondary schools, and supporting the development of objective classroom-ready material. The CCPA is also supporting the School of Journalism at the University of Western Ontario in establishing an Institute for Environmental Journalism.

Recommendations

- Environment studies should be established at all school levels

- Focus on improving the competence and objectivity of those involved in various education processes, including teachers, media

- Provide multi-partite support for development of curriculum material for use in the classroom through existing mechanisms wherever possible.

- Encourage universities to add environment to the curriculum of their schools of business and journalism.

LEGISLATION AND REGULATION

Considerations

- Industry needs a clear set of rules on what is expected of it in environmentally-related matters. Such rules can be implemented through many instruments (regulations, economic and even self- developed). The balance should be governed by consistency, effectiveness and efficiency in reaching agreed objectives.

- While multi-partite consultation processes, as described in the general statement section of our paper, may be more time consuming at the outset, results are obtained more quickly because of a buy-in by all the parties who participated.

- The government has a long list of tools available to ensure compliance. The first efforts should always be focused on educating and informing, aiming at voluntary compliance thereby lessening the pressure on enforcement activities.

- Generally, the federal and provincial governments have sufficient laws to deal with environmental matters. Regulations must be justified on a case-by-case basis.

- It is imperative that a proper balance between enforcement and compliance is maintained. Enforcement and prosecution should be reserved for those cases of deliberate environmental damage. In addition, the abatement and enforcement functions should be kept separate.

- Government should ensure that if it sets out on a regulatory development course in a certain area, it has adequate resources to carry it through. All too often, insufficient resources have resulted in inadequate identification of the problems, incomplete review of available options, inadequate assessment of the consequent impacts. Senior management should require a full plan of the process before starting it and discuss it with the other interested parties.

- While the objective of streamlining regulation development is one that must be pursued, there can be no short-cut. As noted in our general statement, the integration of environmental and economic considerations does mean that the optimum reconciliation must be achieved. There are potentially difficult impacts on both sides of this equation and all must be identified along with the best options. The consultation process spelled out is the only one that will allow the best results and full buy-in by all the parties. The process will streamline itself as the various involved parties move along the learning curve. Finally, in terms of accessibility, the various interested parties, such as industry or environmental groups, should be encouraged to try to develop consensus within their own group area in order to facilitate the consultation process.

ECONOMIC INSTRUMENTS

(The comments are more fully developed at Appendix 3.)

Considerations

- CCPA concurs that economic instruments can be an effective complement to, and in some cases a substitute for, environmental regulation, but that further work is needed to assess fully the merits of using economic instruments. Economic instruments can be used as an incentive to achieve compliance but there must be clear standards and a reasonable timetable set in advance.

- CCPA believes that in deciding whether to use economic instruments to complement or substitute for environmental regulation, there should be a major focus on what mechanism will be the lowest cost, most equitable, and economically efficient to administer.

- CCPA believes in the basic principle of "polluter pay".

Economic instruments therefore should not detract from this principle nor should their scope significantly distort competitiveness between individual companies.

- The use of economic instruments should not conflict with the simplification of the tax system and the avoidance of dedicated or specific taxes. Such taxes have a tendency to remove specific expenditure programs from the normal discipline of overall government expenditure prioritization exercises and on the other hand, develop pools of funds which are dormant for some time and may be diverted to other purposes.

- The incidence of any economic instrument should minimize side effects and achieve its objective, as agreed in multi-partite consultation, in the most efficient manner.

- Alberta is not an isolated province nor is its industry. This is elaborated in the section on the "International Challenge". In examining the feasibility of using economic instruments, the impact on international competitiveness must be taken into account, and this should be minimized. Otherwise, unless demand patterns change within Canada, all that will be achieved will be a transfer of production to other provinces and countries and imports of final products. However, we may no longer have the money to pay for them because of lower economic activity.

Recommendation

- There is need for concerted multi-partite consideration of economic instruments, their feasibility, impacts and effectiveness.

STRENGTHENING PARTNERSHIPS

Considerations

- In the "general statement" section of this paper, CCPA stated the need for government being a catalyst for cooperation rather than confrontation. Optimum merging of environmental and economic objectives for Alberta can only be achieved by early and ongoing consultation with all interested parties towards consensus building.

- Internationally, Canadian unilateral solutions may harm

Canada's economic performance while having little beneficial impact on the global problem. The Canadian government must seek to catalyze international action rather than acting unilaterally. CCPA would support greater Canadian participation in international institutions but with Canadian positions in such forums only being taken after multi-partite consensus within Canada.

- Coordinated federal/provincial action is absolutely essential if economic development is to be sustained within environmental imperatives. This co-ordination must include working towards national standards which are consistent, and the streamlining of assessment and approval processes in a "one-stop shopping" approach. Industry must be able to react quickly to development opportunities, otherwise, because of globalization, such opportunities will be captured by other countries. We are not stating that assessments be forgone but rather that they be done expeditiously.

Recommendations

- The provincial government should promote ongoing forums where all interested parties can meet and build trust and understanding on the subject of environmentally sustainable economic development. The National Round Table and its provincial counterparts, as well as the Niagara Institute approach, should be considered as valid models, but to be successful more participants m all parties must become involved in building trust and creating consensus.

THE HEALTH DIMENSION

Considerations

- The CCPA, in the guiding principles of Responsible Care which are signed by each member company CEO as a condition of membership in the association, states its commitment that operations shall not present an unacceptable level of risk to employees, customers, the public and the environment. In addition, CCPA assumed a leadership role amongst industries in developing the Workplace Hazardous Materials Information System (WHMIS). CCPA wishes to restate its commitment to the health dimension and to participate in the development of specific initiatives to address the links between environment and health.

- Fundamental to the health dimension is the need to recognize that the effects of pollution are a function of dosage, that is, to both the toxicity of the material and the extent of exposure to the material. The toxicity of a material is an inherent property and cannot be changed. These characteristics are being defined to the degree required by the CEPA regulations for both new and existing chemicals. The risk presented can therefore only be controlled by reducing the level of exposure. It is important to ensure that all statements about the potential effects of chemicals be made in terms of their risks and not simple their toxicological properties.

GLOBAL WARMING

Considerations

- Reducing scientific uncertainty must be the primary objective at this time. Such a consensus appears likely to emerge this year in reviews of the Intergovernmental Panel on Climate Change work group reports and at the World Climate Conference in November. Canadian and international actions should await their results.

- Global warming, as the name implies, is a global issue which requires global solutions. Alberta, by itself, cannot significantly contribute to the solution since Canada accounts for only about 2% of the world's emissions. It's biggest contribution should be in catalyzing international action, commensurate with any scientific consensus achieved later this year.

- International targets for emission reductions are being considered. Under such an umbrella, it will be important to recognize that the level of the playing field is not the same for all countries. Percentage reductions, as an example, for Eastern European countries and their industries, will be more easily achieved and less disruptive than the same percentage reduction applied to Alberta, and its industries. Even within Albertan industry, some sectors have already demonstrated leadership in improving energy efficiency. The chemical industry has been in the forefront of these efforts since inception of the program, with an increase in efficiency above 40 percent. Further improvements will only be achieved mostly through building totally new plants.

- Alberta should focus on a program to reduce carbon dioxide emissions by pursuing strategies that are beneficial in their own right, such as support for clean technologies, and specific energy efficiency measures.

- Unilateral actions, as noted above, will not contribute significantly to the global solution, and yet may create severe economic pressures on the competitiveness of Albertan industry. Imposition of regulations or use of domestic economic instruments should only be implemented once the net improvement in emissions will have been demonstrated and once the impact on Albertan industry and on the Albertan public will have been clearly understood by the affected parties. Of particular importance will be the differential impact on competitors outside of Alberta. For example, fuel for the transportation of chemicals could make it much easier to ship from U.S. border towns than from Albertan industrial sites.

- The Albertan petrochemical industry depends extensively on petroleum and natural gases for its raw materials. If regulations or economic instruments such as taxes are considered essential to combat global warming, feedstocks should be excluded from all such measures.

OZONE DEPLETION

Considerations

- CCPA supports internationally coordinated actions to eliminate the production and use of CFC's as soon as possible. In fact, members of the Canadian chemical industry have shown themselves to be in the forefront of studies and actions to bring about the required changes.

- Specific regulatory initiatives to prohibit particular uses of CFC's should not be undertaken until effective substitutes can be found and are commercially available in adequate quantities. Such initiatives should be coordinated across the country.

- If alternative products are to be introduced and promoted, potential producers will have to receive acceptable assurances that they will be able to produce long enough to recover their initial investment.

AIR QUALITY AND TOXIC POLLUTANTS

Considerations

- Recent studies are showing that emissions of VOC's from the chemical industry are much lower than had originally been expected. International conventions that do not take this into account could unfairly penalize the industry for already being environmentally responsible.

- There is increasing concern that long range transportation is the most important input of toxic chemical, therefore an effective Albertan solution can only happen in conjunction with Canadian and U.S. actions.

Recommendations

- Urge the Federal Government to negotiate a transboundary air quality accord with the United States and develop a Parallel control program.

- Insist that the basis for any international protocol on emissions be based on emission standards as opposed to simple percentages.

APPENDIX 1

CANADIAN CHEMICAL PRODUCERS' ASSOCIATION

LIST OF MEMBERS

Akzo Chemicals Ltd.
Albright & Wilson Americas
Alby Chlorates Canada Inc.
Alcan Smelters & Chemicals Ltd.
Alchem Inc.
Alkaril Chemical Ltd.
Allied-Signal Canada Inc.
Ashland Chemicals
ATKEMIX Inc.
ATOCHEM North America
BASF Canada Inc.
H.L. Blachford Ltd.
Borden Packaging & Industrial Products
Canadian Occidental Chemical Group
Carbochem Inc.
Carlew Inc.
Celanese Canada Inc.
Chatterton Petrochemical Corporation
Chinook Chemicals Company
CIBA-GEIGY Canada Ltd.
Commercial Alcohols Limited
Courtlands Canada
Cyanamide Canada Inc.
Daishowa Chemicals Inc.
Dow Chemical Canada Inc.
Du Pont Canada Inc.
Eka Nobel Canada Inc.
Esso Chemical Canada
Ethyl Canada Inc.
G.E. Plastics
General Chemical Canada Ltd.
B.F. Goodrich Canada Inc.
Hart Chemical Limited
Henkel Canada Ltd.
Hercules Canada Inc.
Himont Canada Inc.
Hoechst Canada Inc.
Huls Canada Inc.
ICI Canada Inc.
Kemtec Petrochemical Corp. Inc.
Kronos Canada Inc.
Lubrizol Canada Limited
MARSULEX Inc.
Monsanto Canada Inc.
Nacan Products Limited
National Silicates Limited
Nitrochem Inc.
Noranda Sales Corporation Ltd.
NOVA Corporation of Alberta
Ocelot Chemicals Inc.
Oxychem Canada Inc.
PPG Canada Inc.
Pacific Industries
Petromont Inc.

Pigment & Chemical Inc.
Proctor & Gamble Inc.
Raylo Chemicals
Recochem Inc.
Reichhold Limited
Rhone Poulenc Canada Inc.
Rohm & Haas Canada Inc.
Shell Canada Chemical Company
Stelco Inc.
Sulco Chemicals Limited
Surpass Chemicals Limited
Tioxide Canada Inc.
Union Carbide Canada Limited
UNIROYAL Chemical
Welland Chemical Ltd.
Witco Canada Inc.

1 May 1990

APPENDIX 2

DISCUSSION PAPER

EDUCATION - THE THIRD REQUIREMENT

As stated in the document the main purpose of education regarding the environment is as one of the strategic elements leading to better decision-making.

Although often treated as a separate element, education cannot be treated in isolation from the various flows of information which create the sum total of one's knowledge and attitudes.

It is a major component but it is not the only source.

The general inference of education is that it is aimed at those in attendance at academic institutions. Although the main direction of this response will follow this path it must however touch on those other sources of information which contribute to the individual's overall awareness and knowledge of matters relating to the environment.

In addressing this transmission of information it is important to recognize that the understanding and attitudes formed are a function of the information itself, the source of the information and the channels through which the information moves.

In addition to being the agency by which information moves, the educational system must provide the basic skills by which new information can be acquired, assimilated, digested and enhance the knowledge of the individual.

The long range purpose of the educational process, although described as "an environmentally educated population which will demand that all sectors of society meet a high level of environmental responsibility" is more than that.

A public which is better educated with respect to the environment is able to:

(a) make more environmentally sound personal choices
(b) better evaluate and support proposed legislative and regulatory initiatives
(c) develop an environmental ethos which ultimately pervades all sectors of society
(d) better evaluate the flow of environmental information as it emerges

Developing the skills necessary to process new information as well as cope with the current plethora of data, conflicting views and rhetoric surrounding the environment requires a balanced approach to the presentation of information.

The principle of balance is one which must permeate the total process of information flow. The second fundamental principle is to utilize existing partnerships to address the development of environmental curriculum rather than creating new bureaucracies.

In looking first at the area of information one must do so within the overall context of improved decision making and the other elements which are key to the process.

The quality of the end result will obviously be first a function of the quality of the input. To quote, "good science is essential for good environmental policy and sound regulation. It is indeed the process by which existing situations can be described, progress is measured and new problems identified".

The quest for better science leads directly to the second key factor - which is more information about the environment. The caution to be made here is that more is not necessarily better. As stated, "good decisions require good information".

This element is as crucial to the legislative and regulatory process as it is to the decision making process. The knowledge upon which decisions are based may be presented in different forms depending on the nature of the decisions to be made. The essential fact is that the information must be the best that is attainable and as balanced and objective as possible.

Where there is a difference between theory and fact this must be clearly identified, the tenuousness of the theory clearly understood and the reliability of the factual information properly established.

In many cases the authors of theory are accorded a higher degree of credibility than are the sources of fact. There must be no effort to subvert the transmission of theory but the ability of the public to deal with these potential conflicts must be improved. There ability to evaluate both the source and the nature of the information must be a primary goal of the educational process.

In looking at the educational process the first requirement must be to achieve both competence and objectivity on the part of the educators. The second requirement is to have this competence transferred to those being educated.

In an area as contentious and politically sensitive as the environment it is crucial that those being educated are capable of forming their own opinions as opposed to having the opinions of others induced (or imposed) on them.

Environment should not be an instrument to be used in the pursuit of ideological goals but as a goal unto itself.

Earlier in this paper it was suggested that a holistic approach be taken with respect to the information process.

If educators are considered part of the information process so are the media. This would suggest that in addition to educating the educators to deal with the subject of the environment in a balanced way, so should those engaged in the professional communications field be better equipped to provide a more balanced and objective presentation of information.

The first priority must be to improve the efficiency or competence of those in control of the flow of information i.e. educators, practising media professionals, those "in-training". As the system evolves and improves, this level of environmental competence will find its way into those involved with the creative communications process.

The second priority is to develop the information which will be used in the classroom setting. Since the formal inclusion of environment in the school curriculum must be with the agreement of the provinces, the development of environmental curricula will be subject to a more disciplined process than that which exists at present.

It would appear that the current flow of environmental curricula is driven primarily by the self-interest of its authors. Each stakeholder has the inherent belief that its materials are an accurate presentation of the situation. The result is a range of materials of considerably disparate quality in presentation and content.

The first priority must be an agreement that environment or environmental studies become a formal component of the primary and secondary school curriculum.

The second must be the upgrading of the teachers so they possess the necessary balanced background to participate in the development of appropriate curriculum of a balanced nature.

The third step must be the production of the supporting curriculum materials which will achieve the desired balance.

In the case of the first priority there appears to be sufficiently widespread concern regarding the environment that acceptance of it as a curriculum subject is virtually a given

In the case of the second and third elements several efforts currently exist which bring many of the stakeholders together in a cooperative effort to address the development of curriculum material on energy and the environment.

Specifically these fora are Society, Environment and Energy Development Studies (SEEDS) which dates back to the mid-seventies as an effort to improve the level of public understanding of energy matters.

Modelled after it and following the same processes are the Canadian Environmental Education Association and The Foundation Riou-Delorme.

It is recommended that the government examine these existing organizations with a view to determining the possibility of utilizing them to develop the desired curriculum materials. The efforts of these organizations can be significantly advanced and enhanced with proper government support. Thus far the financial and human resourcing has been provided essentially by the private sector! Recognition by governments of these efforts and increased resourcing would create significant progress toward achieving improved environmental literacy.

The concept utilized by all three organizations is to utilize teachers with assistance from industry and the environmentalists to develop environmentally oriented curriculum material.

The starting point, however, involves the provision of a forum in which teachers have access to various viewpoints and environmental information. These fora bring educators, environmentalists, media representatives and industry together with the purpose of improving their ability to deal with environmental issues.

After this has been accomplished the educators determine the subject areas and the aspects to be addressed. Using the assistance of industry and environmentalists as they see fit the curriculum materials are subsequently developed.

This initial effort at an environmental educational partnership, although in a relatively embryonic stage, is sufficiently well advanced to assist both the federal and provincial governments to achieve their environmental educational objectives.

Although the initial impetus came from the private sector, the essential principle guiding these efforts is that the materials thereby produced possess the highest possible degree of integrity. This means they must provide an opportunity for exposure to the issues as viewed by all the stakeholders. It is through this relatively balanced learning process that the environmental literacy of the individual student is enhanced.

Earlier reference was made to the role of media in the process of environmental education.

It is recommended that governments encourage universities to add environment to the curriculum of their courses in journalism.

There is an effort currently underway involving the University of Western Ontario and industry to create an Institute for Environmental Journalists.

Its objective is to provide an opportunity to improve the reporting profession's ability to deal with environmental matters.

Similar institutes dealing with law and economics already exist and are being used as the model in developing a similar concept for environment.

Recognition of this effort by governments and direct support would greatly expand participation by the media, environmentalists and industry.

Again, the underlying principle is to acquire an ability to achieve balance but to use existing structures to address the issue.

Permeating the proposed methodologies is a recognition that the stakeholders exist in a common environment. These same stakeholders have demonstrated a shared concern for the environment and both a willingness and specific examples in which the shared concerns have transcended narrow self-interests. There are a significant number of examples at the national, provincial and local community level where these stakeholders have worked cooperatively to achieve a mutually agreed upon set of objectives.

The various efforts referred to are specific examples of this new found spirit of concern and cooperation.

APPENDIX 3

ECONOMIC INSTRUMENTS

Background

The Federal Government has stated that it believes that economic instruments may be an effective complement to, and in some cases, a substitute for, environmental regulation. Because of the limited experience in Canada and other countries with such instruments, the Government has indicated that further work is needed to assess the merits of these instruments as a means of achieving environment objectives.

It, therefore, stated in its discussion paper "The Green Plan":

> Following the release of The Green Plan, the Government intends to initiate a detailed discussion of the advantages and disadvantages of economic instruments, involving individuals, environmental non-governmental organizations (ENGOs), business and the university community.
>
> Further, there may be a need for a special program to stimulate applied research into the application of economic instruments to environmental problems - perhaps through a specialized university network.

Considerations

In assessing whether to use economic instruments and/or command and control regulations and standards to achieve environmental objectives the Provincial Government should give careful consideration to the following points:

- the "polluter pays" principle should be upheld;
- environmental problems are caused by Albertans at all levels of society;
- solutions will require large costs, e.g., Informetrica has estimated that adopting best environmental technology will cost $84 billion capital expenditures and $17 billion in operating expenditures by the end of the decade;
- the magnitude of these costs must be recognized up front before deciding who should bear them and what mechanism should be used to meet agreed environmental objectives;
- there should be a major focus on what mechanism would be lowest cost, most equitable, economically efficient and lowest cost to administer;
- the use of economic instruments should not conflict

with one of the key objectives of the Federal Government's recent tax reform legislation - the neutrality of the tax system and the avoidance of dedicated or specific taxes.

Cleaning Up Existing Dump Sites

- responsible party should pay;
- if responsible party cannot be identified or is insolvent then society at large should pay for clean up through broad based taxation;
- responsible party should have to pay when responsible but not when it is NOT responsible;

Curtailing Current and Future Pollution

- the responsible party or polluter should continue to be responsible;
- CCPA member companies are making environmental considerations part of business planning process and assess environmental impacts of projects before they proceed;
- CCPA companies must also adopt corporate environmental policies according to Responsible Care and they are encouraged to recycle and reuse and develop products which are as compatible with environment as possible;
- they recognize that paying attention to the environment is also in the best interests of the company;
- although co-operative approaches which seek mutually advantageous solutions are best, reduction of pollution is also being driven by tighter and tighter government regulations;
- the effectiveness of regulations should not be underestimated - governments have ensured that the penalties associated with non-compliance are extremely high;
- so long as the regulations are appropriate and developed through multi-partite consultation, are necessary, economically efficient, cost effective, equitable and allow sufficient time for compliance, CCPA believes they should be an integral and usually necessary part of a system which requires the polluter or responsible party to pay;
- since environmental problems do not respect boundaries

the regulatory approach must be Coordinated among jurisdictions, both within Canada and internationally;

- failure to do so would mean that material and global improvements in the environment would not be achieved, and the costs could be imposed on Albertan companies;
- potential for regional dislocation in Canada as some plants close in response to more stringent regulations in some provinces but not others.

Use of Economic Instruments to Achieve Environmental Goals

- CCPA agrees that regulation alone may not be a complete answer and that the use of some economic and financial instruments should be carefully assessed to see if they might be issued in conjunction with or in place of regulations and standards to achieve environmental objectives;
- because of the lack of experience with economic instruments in both Alberta and Canada as well as elsewhere and a concern that they will frequently be less economically efficient, more costly to administer and less equitable than regulation or standards CCPA feels that economic instruments must be carefully assessed before making any decision about whether to use such instruments to achieve environmental objectives in Alberta;
- some of the questions that need consideration are:

  Environmental Taxes

  - what would be the impact on international competitiveness;
  - what would be the purpose of the environmental tax - to reduce consumption or pay for cleanup?
  - if to reduce consumption, would a tax be effective at reasonable levels when demand for the produce (e.g. energy) may be quite inelastic, would the tax then be just a source of new revenues;
  - would not a tax of this type be inconsistent with the federal government's goals of tax neutrality and the avoidance of dedicated taxation?
  - if government taxation is to pay for clean ups, should the tax program recognize the

polluter pays principle and revenues only be used where responsible parties cannot be identified or are insolvent;

- should such a tax be broadly based, for example, through a sales tax, in order to recognize the societal responsibility for cleanups and avoid penalizing those who are already paying to cleanup as responsible parties;

Economic Instruments such as Effluent Charges, User Charges Transferrable Emission Rights, Deposit Refunds

- would they be consistent with the polluter pays principle;
- would they, in effect, be a form of a dedicated or specific taxation which punitively hit companies which were in compliance with accepted regulations and standards while giving other companies a "licence to pollute";
- is there evidence to show they are more environmentally effective, economically efficient and as equitable as regulations and standards;
- could they be set at rates which would be effective but not impair international competitiveness;
- would they be easy to administer at low cost;
- could they be implemented effectively across the three levels of government;
- would they impose an economic burden which is fairly distributed;
- would they provide sufficient incentives to result in prevention;

Grants, Loans and Other Financing Measures

- would there be a way to design these instruments so they would be consistent with the polluter pays principle and the need to be neutral in providing government assistance to the private sector;
- would they involve the government in competition with private sector financing;
- would the costs be too high in relation to the results achieved;
- could they be applied so as to not unfairly differentiate between individual companies;
- would they involve relatively complex interaction with the tax system;

CONCLUSION

In assessing whether to use economic instruments to complement or to substitute for environmental regulations, it is essential that:

1. the polluter pays principle be maintained.
2. the choice be based on the mechanism which is found to be the lowest cost, the most equitable, economically efficient and the lowest cost to administer.
3. the choice should minimize the potential for conflict with other government policies.

NATURAL GAS AND THE ENVIRONMENT

A POSITION PAPER PRODUCED BY:

THE CANADIAN GAS ASSOCIATION

AND

THE ONTARIO NATURAL GAS ASSOCIATION

June, 1990

INTRODUCTION

This report tables the position of the Canadian Gas Association and the Ontario Natural Gas Association as it relates to environmental degradation. While natural gas has an increasingly important role to play in combatting all pollution - including the problems of solid wastes, water pollution etc., the paper deals specifically with problems of atmospheric pollution.

The Canadian Gas Association (CGA) is the national trade association for Canada's natural gas industry and has over 500 members, including production, transmission, and distribution companies, manufacturers of components, equipment and appliances, pipeline contractors, brokers, supporting service companies and private individuals.

In addition to the normal trade association activities, CGA is accredited by the Standards Council of Canada to sponsor the writing of national standards for the industry, and to certify and test gas appliances and equipment.

CGA is also actively involved in an industry-sponsored research and development program to develop natural gas vehicle technology applicable to cars, light and heavy duty trucks, and urban transit buses. An affiliate of CGA, the Canadian Gas Research Institute (CGRI), carries out gas industry-related research projects selected by its members.

The Ontario Natural Gas Association (ONGA) is the provincial voice of the natural gas industry. With over 300 members drawn from distributors, producers and manufacturers of gas appliances and equipment it represents the industry's collective views in public forums.

EXECUTIVE SUMMARY

To the extent that energy is essential to our existence, and that fossil fuels are a major contributing factor to atmospheric pollution, it is axiomatic that maximum efficiencies in energy use be sought while the longer term search for non-polluting energy sources continues.

In the interim, natural gas will play an increasingly important role in the fight against environmental degradation. The use of natural gas directly with or in place of other fuels in residential, commercial, industrial and transportation application provides reduced environmental impact in two ways:

- The process is frequently more efficient, so that total energy use is cut.
- When energy is supplied in the form of natural gas, pollutant release per unit of energy is less.

Natural gas is the least carbonaceous of the fossil fuels - it is therefore the least polluting. In the context of atmospheric change some of its inherent advantages are:

- Taking into account all steps in the full fuel cycle, natural gas contributes less to global warming.
- Natural gas combustion produces no sulphur dioxide (though a small amount of sulphur dioxide is released during the gas processing stage); it therefore contributes much less to acid rain than do the other fossil fuels.
- Natural gas does not contain substances which erode the ozone layer.
- Natural gas combustion produces fewer nitrogen oxides and complex hydrocarbons and therefore by itself contributes less to photochemical smog.

The beneficial effect of increased use of gas, directly with and in substitution of other fossil fuels, will be felt in its application in all market sectors - industrial, commercial, residential and transportation. In the process, growing markets will stimulate gas exploration and development activity, assist economic development, and improve Canada's energy security.

ENERGY AND THE ENVIRONMENT

While there are no quick and easy solutions to the environmental concerns currently before us, it is obvious that they require action. What kind of action is under global scrutiny, but more prudent use of energy resources is considered by many to be a major step in the right direction. Since human initiative helped create the problem, our collective intelligence is being challenged to create and implement the solutions. Full-scale efforts to conserve energy and to use it more efficiently will help. So will the development of non-polluting energy sources, though it will be some time before the benefits of such measures are felt.

Energy is essential to our existence; we need it to fuel our economy and heat our homes. But no form of energy is entirely benign. The fact is that producing, transporting and using energy affects our environment. Finding ways to minimize the impact is of increasing importance to government, industry and consumers. It's a vital and intricate task that the scientific community in Canada and around the world is addressing.

While natural gas may not be the ultimate "environmentally friendly" fuel, it does have an increasingly important role to play in combatting pollution. By all measures -- air emissions, solid wastes, water pollution and water consumption -- natural gas is an environmentally desirable fossil fuel:

- Taking into account all greenhouse gases and all steps in the fuel cycle, natural gas contributes less to the greenhouse effect than do the other fossil fuels.
- Natural gas when utilized does not contain substances which erode the ozone layer.
- Photochemical smog is produced by releases of nitrogen oxides and complex hydrocarbons. Natural gas combustion produces fewer of these hydrocarbons and therefore contributes less to photochemical smog.
- Natural gas combustion produces no sulphur dioxide; it therefore contributes less to acid rain than do the other fossil fuels.

ATMOSPHERIC CHANGE

1. Greenhouse Effect

The threat of global warming ranks as perhaps the foremost environmental concern today. Many scientists believe that the average earth surface temperature will rise in response to higher concentrations of carbon dioxide and other constituent gases in the atmosphere. The regional repercussions of climate change could be serious.

The atmosphere readily transmits radiation from the sun to the earth's surface. However, the atmosphere is not completely transparent to the longer wave energy reradiated by the earth's surface. The result is the beneficial greenhouse effect which exists now and which has existed for millions of years.

Population growth, increased industrial and agricultural activity, and increased energy demand all tend to increase the concentrations of atmospheric gases. The result could be an undesirable heightening of the present beneficial greenhouse effect.

The atmosphere is made up of 78% nitrogen, 21% oxygen, plus many other constituents present at lower levels. Some of these "other constituents" such as **water vapour, carbon dioxide, ozone, chlorofluorocarbons (CFCs), methane and nitrous oxide,** can trap energy radiated by the earth. They also moderate the sun's effect on the earth, and without them it is estimated that the average earth surface temperature would be -18°C.

Carbon dioxide is produced by combustion of fuels such as coal, oil, natural gas, wood, peat, gasoline and propane, as well as through biological and other processes.

Although **ozone** is not directly released in large quantities by industry or vehicles, various substances that are released by combustion, and other processes, react in the atmosphere to produce ozone.

Methane, a gaseous hydrocarbon that occurs naturally in large amounts, is a product of decomposed organic matter such as in swamps, and enteric fermentation in animals, particularly ruminants. It is also released by coal, oil and gas production and processing, incomplete combustion and systems leaks.

Chlorofluorocarbons (CFCs) are synthetic compounds developed in the 20th century. They are used as propellents, refrigerants and for use with fire fighting equipment.

Nitrous oxide is produced during combustion by the oxidation of nitrogen in fuel. Nitrogen is found in molecular combination in oil and coal, but not in natural gas. (It is important to note that in this document the term "nitrous oxide" means ONLY the specific chemical compound N_2O. This meaning is the same as that accorded to the term in the field of chemistry. Later in this document there is reference to "nitric oxide" which means only the specific chemical compound NO, again in agreement with chemical usage.)

Not all of the gases contributing to the greenhouse effect result from the process of fossil fuel combustion. Some of the fastest growing and most effective of these gases are CFCs. Although CFCs are being controlled for their effect on ozone depletion, they may not be adequately considered for their potential contribution to global warming.

The remainder of this section of the paper relates to the effect of fossil fuel use as it pertains to global warming.

The world's demand for energy is increasing at a rate of 2.8% per year. Currently it is estimated that oil accounts for approximately 38% of demand; coal 33%; natural gas 23%. Non-fossil fuels - hydro electricity and nuclear power - account for just 6% of the total.

A comparison of alternative energy forms for their contribution to the greenhouse effect might be relatively simple if only carbon dioxide had to be considered. However, a dozen or more gases are involved, three of which are directly related to fuel and energy use - carbon dioxide, methane and nitrous oxide.

Carbon dioxide is the main product of all combustion processes. There is debate concerning the portion of the presently existing beneficial greenhouse effect which is due to carbon dioxide. Most of the present greenhouse effect is due to water vapour. But some scientists believe that water vapour is only found in the atmosphere due to warming created hundreds of millions of years ago by carbon dioxide. In any case, there is agreement that the contribution of methane is less than half that of carbon dioxide.

Not all fossil fuels, however, produce the same amount of carbon dioxide in the combustion process. Natural gas, because of its higher hydrogen to carbon ratio, produces the lowest level at 49.4 tonnes per terajoule. Coal combustion produces 79% more; heavy fuel oil 63% more; gasoline 37% more:

TABLE 1

CARBON DIOXIDE PRODUCED - TONNES PER TERAJOULE OF FUEL HEATING VALUE - INDUSTRIAL END-USE APPLICATIONS

Natural Gas	49.46
Light Fuel Oil	73.11
Heavy Fuel Oil	80.65
Petroleum Coke	100.00
Coal	88.90
Motor Gasoline *	67.98

* transportation end-use.

Note: 1 terajoule = 950 million BTUs

Source: Federal/Provincial Energy Ministers' Task Force On Energy and the Environment, August 1989.

As well as releasing carbon dioxide, the oil, coal and natural gas fuel cycles each produce methane. In addition, since some coals and oils have nitrogen in their fuel molecules, the combustion of these energy forms also releases nitrous oxide. Natural gas does not release nitrous oxide since its fuel molecule is devoid of nitrogen.

The contribution of a given fuel cycle to the greenhouse effect must take into account the amount of each gas released, and the activity of that gas in contributing to the greenhouse effect. For example, the activity of methane is estimated to be as much as thirty times higher than that of carbon dioxide on a unit basis. However, the amount of methane released by the natural gas fuel cycle is small. Therefore, the overall contribution of the natural gas fuel cycle to the greenhouse effect (considering carbon dioxide and methane) is smaller than that of the other fossil fuels.

As the following table shows, natural gas losses account for less than two percent of the total worldwide releases of methane. Global releases of methane are overwhelmingly caused by marshes, paddy fields, and enteric fermentation in animals:

TABLE II

Source	**rate of methane release in millions of metric tons per year**
Enteric fermentation in animals	90 to 220
Oceans	10
Marshes/wetlands	190 to 330
Paddy fields	35 to 280
Biomass burning	10 to 110
Anthropogenic activities	100 to 210
Natural gas losses	10
Termites	2 to 5
Earth interior	less than 30

Source: Energy and the Atmosphere, A Physical - Chemical Approach by I.M. Campbell

While the activity level of methane is higher than that of carbon dioxide, it is effective for a considerably shorter period in the atmosphere. The half life of methane is estimated at 7-10 years; the half life of carbon dioxide is many times greater.

In absolute terms, Canada, because of its relatively small population and industry base, is not a large contributor of atmospheric gases. Indeed, when viewed from a methane leakage perspective, Canada's natural gas industry appears to outperform that of the remainder of the world on average, due to higher standards of pipeline and system integrity.

In July and August 1989, the Alphatania Group, London, England, surveyed 41 natural gas operating companies around the world to determine the extent of methane leakage from their operations. It was the Group's conclusion that the world gas industry is efficient in the conservation of natural gas within its system with an overall throughput leakage factor of 0.63%:

TABLE III

Range of Specific Estimates of Methane Leakages Based on Operational Data

Production	0.20%
Transmission	0.13%
Distribution	0.30%
Total	0.63%

Source: Alphatania Group

Member companies of the Canadian Gas Association produce, transport and distribute almost all of the natural gas utilized in Canada. Available data from these sources indicate that the Canadian experience is better than the 0.63% suggested by the Alphatania survey. The low estimated leakage factor of 0.3% is perhaps due to Canadian facilities and systems which are generally newer and of a higher standard than the worldwide average.

In summary, the Association's estimate of methane emissions from natural gas industry operations are:

Transmission	0.018%	to	0.082%
Distribution	0.030%		0.030%
Production	0.250%	to	0.250%
	0.298%	to	0.362%

Estimating the contribution of methane release from the natural gas fuel cycle to any future global warming is complicated by lack of agreement on the contribution which should be ascribed to water vapour. If water vapour is assumed to account for 50%, and if methane is assumed to account for 20% of the remaining 50%, and if natural gas industry release of methane is 2% of the world total release of methane, then the worldwide natural gas industry contribution to any future global warming is:

$$.02 \times .20 \times .50 = 0.002 \text{ or } 0.2\%$$

Nevertheless, the industry in Canada is employing new procedures to preclude waste. An example of this is the use of "blowdown" compressors to salvage gas that is contained in pipe sections upon which work is to be undertaken. The line is depressured by drawing gas off the section in question through a compressor and back into the system, instead of bleeding the pipe down to the atmosphere.

Transmission and distribution systems in Canada are frequently checked for leakage using the latest analytical instrumentation. In this way, leaks are promptly found and repaired and the amount of gas released is minimized.

Gas production wells and facilities are constantly inspected by agencies such as the Alberta Energy Resources Conservation Board, and remedial notices filed with operators. If response is not immediate the wells or facilities are shut in.

2. Ozone Depletion

Ozone present naturally in the stratosphere (25 km above the surface of the earth) absorbs the harmful portion of the sun's radiation. Four hundred million years ago, before the ozone layer developed, life on earth could only exist in bodies of water which offered protection from radiation.

An unstable compound, ozone naturally and continuously decomposes and re-forms. The ozone concentration in the stratosphere is the result of a balance between these complex opposing forces. Industrial activity introduces foreign substances, such as chlorine, into the stratosphere. These foreign substances can influence the balance between ozone production and destruction, frequently in the direction of reducing the ozone concentration.

The synthetic compounds known as chlorofluorocarbons (CFCs or Freon), were developed in the 20th century for use as refrigerants. The compounds are stable and are not destroyed in the lower atmosphere, therefore they enter the stratosphere where they are broken up, releasing chlorine. Canada has been a world leader in developing programs to restrict and ultimately end the use of CFCs.

Recommendations to eliminate CFCs have included: tight sealing and recycling of refrigerants; development of new refrigerants to replace CFCs; and phasing out CFCs in pressurized spray cans and in making foam. But since CFCs take several decades to travel from the earth's surface into the stratosphere, the damage will continue for many years, even if CFC release stops immediately.

3. Urban Smog

Photochemical smog can sometimes be seen as a yellow or brown haze on the horizon in urban areas. Smog is a mixture of ozone, peroxyacetyl nitrate (PAN), nitrogen compounds, aldehydes, and a range of other substances. In addition to undesirable environmental and health effects in urban areas, smog can be carried downwind to damage crops and forests hundreds of kilometres away.

The components of smog, mentioned above, are not directly released by industry and transportation. These sources release reactive hydrocarbons, nitric oxide, and carbon monoxide. In the presence of sunlight, the latter substances react to form the smog components.

The term "reactive hydrocarbons" is usually taken to mean all hydrocarbons other than methane. The methane molecule is relatively stable and does not participate in the reactions leading to photochemical smog. In use of any fuel in stationary or vehicular applications, there is release of hydrocarbons due to fuel leakage, and due to incomplete combustion, with appearance of hydrocarbons in the exhaust gas. Since natural gas is typically over 95% methane, natural gas leaks and natural gas combustion contribute relatively little to release of reactive hydrocarbons. Therefore, in terms of reactive hydrocarbons, natural gas is a very desirable fuel for industrial and vehicle use.

The interest in methanol as a vehicle fuel is apparently predominantly due to the low reactive hydrocarbon level in the exhaust of methanol-powered vehicles. Natural gas would appear to be preferable to methanol on the following grounds:

- In terms of reactive hydrocarbon release, natural gas vehicles are at least equal to, if not better than, methanol vehicles.
- Methanol is toxic. Significant health hazards could be created in handling of methanol, and by atmospheric concentrations of methanol resulting from fuel releases, and unburned fuel in exhaust gases.
- Methanol is manufactured from other fuels, typically natural gas or coal. There is a significant energy loss in the manufacturing process. Therefore, direct use of natural gas is more efficient.

Now shifting attention to the other smog precursors, nitric oxide and carbon monoxide, the following points can be made:

- Combustion of all fuels produces nitric oxide. For many years the natural gas industry has carried out research to find methods of reducing the amount of nitric oxide produced by natural gas combustion. During the 1980s, this work was extended to natural gas as a vehicle fuel. As an example, an inexpensive insert was developed which, when installed on burners of residential gas appliances, results in reduction of nitric oxide levels to less than half of previous values. Research and development efforts to reduce amounts of nitric oxide released by natural gas vehicles are producing encouraging results. It is expected that, in terms of nitric oxide, natural gas as a vehicle fuel will be at least equal to other fuels, if not better.

- Natural gas burns cleanly and produces less carbon monoxide than other fuels. In vehicular applications, natural gas produces significantly less carbon monoxide than methanol or gasoline.

4. Acid Rain

The term acid rain refers to precipitation which contains higher than normal levels of acidity. The increased acidity is due to release of the acid precursors sulphur dioxide and nitric oxide by industry and transportation. These precursors undergo reactions in the atmosphere to produce sulphates and nitrates. Even in the absence of rain, dry deposition of particulate matter containing sulphates and nitrates can damage soils and surface waters.

Sulphur dioxide is released by two major categories of industrial processes:

- Combustion of any fuel which contains sulphur will produce sulphur dioxide. Natural gas as used in industrial, residential, and vehicular applications contains negligible amounts of sulphur, while some coals and oils contain significant amounts of sulphur.

- Processing and refining of raw materials which contain sulphur frequently result in significant releases of sulphur dioxide.

Refining of sulphur-bearing non-ferrous ore in the Sudbury area of Ontario is a well-known example of release of sulphur dioxide to the atmosphere. Another major worldwide source of sulphur dioxide is the use of coal in electric power stations.

Raw natural gas obtained from gas fields in Alberta and from other gas fields worldwide contains sulphur compounds. As part of the refining of this raw gas, the sulphur compounds are removed. One practical reason for its removal is its potential to aid corrosion of pipelines and combustion equipment.

A large proportion of the sulphur compounds in the raw natural gas are converted to elemental sulphur which is sold to industry for use in manufacturing a variety of products. However, not all the sulphur compounds can be converted. Gas processing plants in Alberta and other producing areas release a small fraction to the atmosphere in the form of sulphur dioxide.

The amount of sulphur dioxide released in this way, per unit of heating value of the processed natural gas, is much smaller than the amount of sulphur dioxide released due to combustion of typical coals per unit of heating value of the coal. Nevertheless, the natural gas industry has worked for many years to steadily reduce the amount released by gas processing. New methods are now recovering 98% of sulphur dioxide.

For example, it was recently announced that new technology will be incorporated into an Alberta gas processing plant operated by a major producer. This new technology is expected to cut sulphur dioxide emissions to under 50% of the present level, with an investment of approximately $4 million. If expectations are met, the new technology will then be considered for other plants operated by the company.

As noted in Section 3, combustion of all fuels produces nitric oxide. Extensive research work, by the Canadian natural gas industry and by other organizations, has the objective of finding ways to reduce nitric oxide releases. One source of nitric oxide in Canada is use of natural gas as a fuel to drive compressors along the transcontinental gas pipeline. Among available engine types and related technology, the natural gas industry is using the technology which produces the lowest possible levels of nitric oxide. Developments which could lower these levels further are under review and will be applied when technically and economically feasible or when required for environmental protection.

NATURAL GAS - PART OF THE SOLUTION

Utilization efficiency improvements, which result in less fuel being used to do the same job, can do a great deal to reduce the effects of our industrial society on the environment.

Natural gas is a fuel which can be precisely controlled and which therefore lends itself to efficiency improvements. Furthermore, the natural gas industry is dedicated to greater utilization efficiency. The Canadian natural gas industry has pursued, and continues to pursue, research and development work with the objective of improving the efficiency of residential, commercial and industrial gas equipment and, more recently, motor vehicles. The accomplishments of this work are too numerous to mention here in any detail. However, some examples are:

- Introduction of high efficiency furnaces for the residential market. These furnaces have seasonal efficiencies as high as 96%, leading to dramatic reductions in fuel consumption.

- Commercial rooftop heating units have been developed which recover heat from ventilation exhaust air. These integrated units can result in cutting fuel consumption in half. They also offer rejection of heat from incoming ventilation air in summer, to reduce air-conditioning load.

- Improved equipment for heat treating and non-ferrous melting furnaces, and advanced regenerative and recuperative burners.

The substitution of natural gas for gasoline and diesel fuel in road transport. This development conveys several significant benefits:

- Reduced greenhouse contribution, taking into account the weighted effects of carbon dioxide and methane releases.

- Conversion of diesel vehicles to run on variable proportions of natural gas and diesel fuel could be an important method of reducing the diesel vehicle particulate problem.

- Generally, urban transit buses and other heavy vehicles running on natural gas rather than diesel fuel can reduce or eliminate odour and smoke (particulate) problems.

- Natural gas vehicles produce lower levels of reactive hydrocarbons and carbon monoxide, thus assisting in resolving the photochemical smog problem.

Natural gas can make various significant contributions to reducing the environmental impact of electric power generation. These include improving efficiency through cogeneration and the use of combined cycle generation and reducing the pollution from existing thermal stations through using natural gas for co-firing with other fuels and substituting off-season gas in the summer months.

To understand the role of natural gas, it may be of assistance to review some basic facts. A thermal station for electricity generation requires heat to produce steam. This heat can come from burning any fuel, or from a nuclear reaction in a nuclear power plant.

In practice, only 35 to 40% of the heat is converted to electricity, and the remainder must be rejected to the environment in the form of waste heat. This means that 60 to 65% of the pollutants released by the power plant are essentially released simply in the course of production of waste heat, which also has to be dumped into the environment.

There are various uses to which the waste heat can be put. However, the waste heat cannot be economically transported over long distances. The amount of waste heat that can be utilized in the immediate vicinity of a large thermal power station is usually only a small fraction of the total available. Furthermore, for environmental reasons, large power stations are usually sited away from population and industrial centres.

Natural gas, because it burns relatively cleanly, is particularly well suited for use in small electrical generating facilities which can be placed on the premises of the user, such as a factory, office or hospital. The waste heat from electricity generation can then be used for space heating and process purposes. The previous direct fuel use by the shopping centre or factory can be largely or completely eliminated. This technique, referred to as cogeneration, can lead to fuel consumption, and pollutant production, less than half the previous total, which included:

- The fuel previously used to produce the electricity used by the factory, office or shopping centre.
- Previous direct fuel use for space heating and process purposes.

Similarly, a method termed "combined cycle" takes exhaust heat from the gas turbine electricity generation process and uses it as combustion air in a boiler, where additional fuel is burned to produce steam to produce more electricity.

With combined cycle the amount of electricity produced from a given amount of fuel can be increased by 15 - 30% in a typical case.

In Canada and worldwide, coal-fired electric power stations are major sources of nitric oxide. Nitric oxide releases can be reduced by a compromise alternative which increases levels of other pollutants and decreases plant efficiency. However, 15 to 20% of the coal can be replaced by natural gas in a technique known as "gas re-burning". With this technique the two fuels can be burned in different locations in the boiler, under different conditions. The overall effect is greatly reduced nitric oxide release, at moderate capital cost, without increased levels of other pollutants, and without losses in efficiency.

In summary, increased use of natural gas, directly with and in substitution of other fossil fuels in residential, commercial, industrial, and transportation applications, provides reduced environmental impact in two ways:

- The process can frequently be more efficient, so that total energy use is cut.
- When energy is supplied in the form of natural gas, pollutant release per unit of energy is less.

In other words, there is a double-barreled effect: less energy use, and less environmental impact per unit of energy.

Increased use of natural gas in all market sectors leads to heightened gas exploration and development activity which will stimulate economic development and improve Canada's energy security.

The Canadian Gas Association and the Ontario Natural Gas Association applaud government initiatives to investigate environmental problems and seek solutions. The Association is prepared to play a full part in the consultative process leading to these solutions.

COFA

CANADIAN OXYGENATED FUELS ASSOCIATION
L'ASSOCIATION CANADIENNE DES CARBURANTS OXYGÉNÉS
One Yonge Street, Suite 1400, Toronto, Ontario M5E 1J9 Telephone: (416) 363-7261

November 29, 1990

Mr. Bob Mitchell
c/o The Clean Air Strategy for Alberta
2nd Floor, Highfield Place
10010 - 106 Street
Edmonton, AB
T5G 3L8

Dear Bob:

The attached presentation is provided to the Advisory Group for the Clean Air Strategy for Alberta on behalf of The Canadian Oxygenated Fuels Association (COFA).

COFA was formed by the Canadian Methanol Industry in 1984 to encourage the responsible use of methanol as a transportation fuel.

Since that time, methanol has become a leading North American alternative fuel candidate for passenger cars and heavy duty vehicles.

Methanol is a liquid fuel and can provide significant reductions in smog, particulate (black soot from diesel engines) and other toxic emissions related to gasoline and diesel engines.

Because it is a liquid, the fueling infrastructure costs related to methanol are similar to diesel and gasoline and indeed much of the infrastructure is presently compatible with methanol or can be made so with modest capital outlays.

If there are any questions on the attached presentation, we would be glad to provide further information.

We thank you for your consideration.

Yours very truly,

David Walker

D.W.T. Walker
Director

Attachments

COFA Presentation
Attachment A - Toxics
GM Lumina
DDC Methanol Engine

COFA

PRESENTATION TO CLEAN AIR STRATEGY
FOR ALBERTA
ADVISORY GROUP

By
THE CANADIAN OXYGENATED
FUELS ASSOCIATION
(COFA)

December 1, 1990

COFA

THE CANADIAN OXYGENATED FUELS ASSOCIATION (COFA)

COFA is an industry partnership organized by the Canadian methanol industry in 1984 to promote the use of methanol in the transportation market. The members include:

Celanese Canada Inc.
Novacor Chemicals Ltd.
Ocelot Chemicals Inc.

BACKGROUND ON METHANOL

Methanol is a colorless liquid presently made from natural gas but which can also be made from coal. Western Canadian production is rated at 2.5 billion litres per year which is approximately 10% of world supply.

Methanol is primarily used for the production of other chemicals ending up in products like plastics, sealants, adhesives and paints. Common uses for methanol include window wash fluid, fondue fuel and gasoline deicer.

Methanol has been used as a high performance racing fuel for many years. It is the only fuel that has been in use at the Indy 500 for over 25 years. Performance and safety are the main reasons for its use at the Indy 500.

METHANOL AS A CLEAN FUEL

Today methanol is a leading North American alternative fuel candidate to reduce tailpipe emissions and thereby improve urban air quality. Urban air pollution has become a major environmental issue in the United States where the American Lung Association have concluded that over 50,000 people die prematurely due to exhaust emission related health effects.

Methanol's air quality benefits have been clearly recognized by the U.S. Environmental Protection Agency (EPA), South Coast Air

Quality Management District (SCAQMD), California Air Resources Board (CARB) and others. Reductions in the precursor emissions to ozone, diesel particulate and other toxic emissions all result from the use of methanol as an alternative to diesel fuel and gasoline.

METHANOL IN LARGE ENGINES

In the case of diesel fuel replacement, Detroit Diesel Corporation (DDC) will have a fully warranted engine fueled by MeOH that will be certified to meet and exceed, by a considerable margin, the 1991 EPA/1991 California urban bus standards. A comparison of the methanol engine (which will be marketed by DDC in 1991 with a calalytic converter) with the 1991 standards is as follows:

DDC 6V-92TA Transit Bus Engine Exhaust Emissions Comparison

GM/GHP-HR on EPA Cycle

	HC	NOx	CO	PART
91 EPA/91 California Standards	1.3	5.0	15.5	.25/.1
1991 Diesel**	.5	4.7	1.3	.22
1991 Methanol*	.2	2.2	.8	.04

* Includes standard catalytic converter

** #1 Diesel Fuel

DDC

The DDC methanol engine is clearly the cleanest heavy duty engine in existence in the world today.

METHANOL IN PASSENGER CARS

With respect to passenger cars and light duty trucks, all the North American automobile producers and most of the European and Japanese producers have, either in development or at the pre-production stage, flexible fueled vehicles that will run on methanol.

These cars will provide significant reductions in ozone pollution since compared to gasoline, methanol produces not only lower levels of emissions but the ozone forming potential of these emissions is significantly less. EPA has reported that methanol flexible fueled vehicles will produce 30-50% less ozone than gasoline vehicles. When fully optimized, dedicated methanol vehicles are expected to produce 80% less ozone than gasoline powered vehicles.

In addition, replacing gasoline with methanol is projected by the EPA to substantially reduce emissions of benzene, 1.3 butadene and polycyclic organic material. This will result in a significant reduction in cancer problems related to gasoline exposure. (Note Attachment A)

Some concern has been expressed with formaldehyde emissions from methanol fueled cars. While tailpipe emissions of formaldehyde can be higher with some of the prototype flex fuel cars, it is most important to recognize that EPA have reported that formaldehyde found in the air comes mostly from the action of sunlight on hydrocarbon exhaust emissions. Since methanol exhaust is less photochemically reactive, ambient formaldehyde levels overall would be reduced compared to gasoline.

Recent emission tests done on pre-production methanol vehicles also suggest that formaldehyde tailpipe emissions will not be a factor by the time these vehicles are commercial.

METHANOL AND GLOBAL WARMING

Methanol substitution for gasoline and diesel fuel has been shown in recent studies to lower CO_2 emissions, thereby reducing global warming from the greenhouse effect.

METHANOL AND ENERGY SECURITY

In addition to the positive impact methanol will have on air quality, it also provides benefits relative to energy security in that it helps to reduce our almost total dependency on oil for our transportation needs.

RECOMMENDATIONS

In light of the above, COFA would like to make the following recommendations:

1) That there be a means of insuring that all new and replacement fueling station tanks be methanol compatible in Alberta.

2) That the Alberta government provide incentives relative to the installation of new methanol tanks, and conversion of existing fuel systems to MeOH compatibility.

3) That the Alberta government specify the purchase of alternate fueled vehicles as part of a provincial clean air policy.

4) That Alberta leave in effect the provincial road tax exemption for methanol and other alternate fuels until they reach commercial status.

ATTACHMENT A

Table 5
Known and Suspected Toxics Emitted from Vehicles Powered by Commercially Available Fuels[40]

SUBSTANCE	GASOLINE	DIESEL	METHANOL
Benzene	o	o	
Xylenes	o	o	
1,3 Butadiene	o	o	
Chromium	o	o	
Manganese	o	o	
Nickel	o	o	
Mercury	o	o	
Arsenic		o	
Lead	o	o	
Cadmium	o	o	
Formaldehyde	o	o	o
Acetaldehyde	o	o	o
Acrolein	o	o	o
Phenol	o	o	o*
Cresols	o	o	o*
PAHs	o	o	o*
Dioxins	o	o	
Nitrosomorpholine		o	
Nitrosamines	o	o	
Nitrobenzene	o	o	
Chloroform	o	o	
Ethylene Dibromide	o		
Ethylene Dichloride	o		
Ethyl Bromide	o		

* Denotes toxics from combustion of lubricating oil.

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[40] James Boyd, Statement to Advisory Board on Air Quality and Fuels.

NOTE: Attached Publications

1. What Can Methanol Vehicles Do for the Environment?
2. Lumina Methanol Variable Fueled Vehicle Unique Components
3. Detroit Diesel Methanol Fueled Engine Program

THE FACTS REGARDING METHANOL

Availability/Usage:

- Canada's methanol industry accounts for 10% of the world supply of methanol and has the raw material potential to guarantee a long term supply.
- Methanol is quickly becoming the preferred alternative fuel for automobile manufacturers in North America, Europe and Japan. A new generation of fuel-flexible cars is currently being developed which can run on any blend of gasoline and methanol.
- Studies have shown that fuel-grade methanol will be competitive with conventional fuels.
- Methanol-fueled vehicle prices, mileage ranges, operating costs, performance and safety all favour consumer acceptance of methanol.

WHAT'S NEXT FOR METHANOL

With increasing attention being paid to cleaner fuels, the importance of methanol will increase as a viable and practical alternative to conventional fuels.

The major hurdle for methanol is to establish the initial market volume so that it will begin to take advantage of the extensive pipelines and other efficient fuel distribution systems currently in place. Methanol already offers important energy diversity and, as crude oil prices rise, methanol will become even more competitive.

WHAT IS METHANOL?

Methanol is the fuel for tomorrow — today. It is a liquid, usually made from natural gas, which is in abundant supply in Canada. It can also be made from a wide variety of raw materials, including coal, lignite, wood and even garbage.

You're probably not aware that methanol is widely used in our day to day activities. It's a major component in windshield washer fluid and gas-line deicer. In the kitchen, we use methanol for fondue cooking, and hobbyists use methanol to fuel model airplanes. It is a raw material for paints, plywood and high-quality plastics, as well as for the most important clean-air fuel additive today — MTBE.

For further information, please contact:

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COFA
CANADIAN OXYGENATED FUELS ASSOCIATION

WHAT CAN METHANOL VEHICLES DO FOR THE ENVIRONMENT?

Printed on recycled paper

Truth of the matter is that in the United States most drivers have already used methanol to help reduce auto emissions.

As lead was taken out of gasoline in the U.S., it was replaced by a methanol derivative — MTBE. This new fuel additive not only made high-performance lead-free fuels possible, but increased the oxygen and octane content of the fuels as well. The benefits were clear then; they're even more important now.

Methanol as today's alternative to gasoline and diesel — in addition to being an important additive — provides an even more dramatic benefit to the environment. Methanol is not science-fiction; it is here today to help us meet our new environmental objectives of cleaner air. Let's take a closer look at the numerous benefits of methanol.

METHANOL AS A FUEL

Methanol is already recognized as one of the safest high-performance fuels available — it's been the only fuel used at the Indy 500 for 25 years.

In passenger cars, buses and trucks, methanol burns very cleanly, significantly reducing air pollutants. As an alternative to gasoline, methanol will have a major impact in cleaning our air by reducing ground level ozone.

Using methanol to replace diesel also significantly reduces sooty particulate emissions and nitrogen oxides which pollute our urban areas.

THE FACTS REGARDING METHANOL

Safety:

- The U.S. Environmental Protection Agency has concluded that methanol, unlike components of gasoline, is not a carcinogen and is not considered a toxic air pollutant.
- Methanol is far less flammable than gasoline, and much easier to handle than gaseous fuels.
- The EPA has concluded that fire risks of methanol are lower than for gasoline. This is particularly true in today's 85/15 methanol/gasoline blend, which provides visibility to the flame and allows cars to start more easily in colder climates.
- The EPA has also concluded that risks associated with spills while transporting methanol are considerably smaller than from transporting crude oil or gasoline.
- The California Advisory Board on Air Quality and Fuels, after a year of comprehensive examination, concluded that methanol use, with standard precautions, does not involve any unusual or unacceptable safety issues — particularly compared to gasoline.
- Handling procedures for methanol are similar to those for gasoline and diesel. Like these fuels, methanol should not be taken internally, and skin contact with all these fuels should be avoided.

THE FACTS REGARDING METHANOL

Emission Reduction:

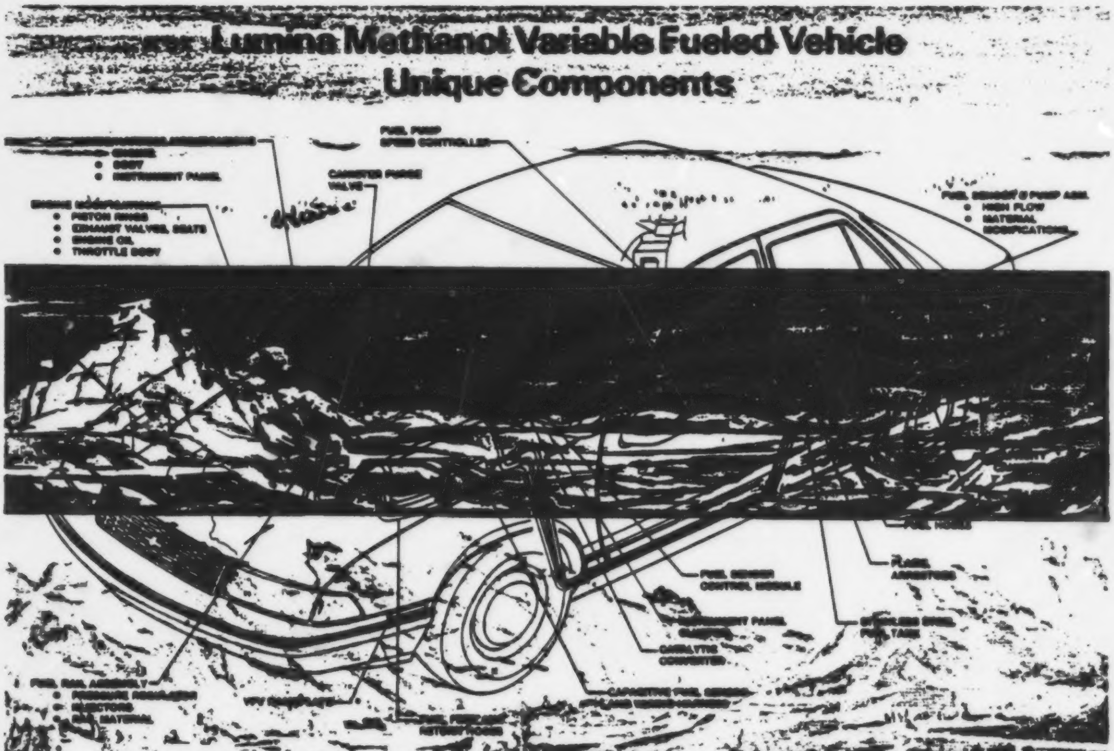
- The State of California, long concerned about energy security and air quality, has recommended that methanol, as well as other clean fuels, be used to improve air quality in Los Angeles. Methanol fuelling stations, passenger cars, buses and trucks are now in use in California, and are expected to grow in significance in that state's clean air strategy.
- Bus and truck engines have already been redesigned and built to run on methanol. North America's largest diesel bus engine manufacturer — Detroit Diesel Corp. — is producing methanol transit bus engines, and 65 methanol-fueled buses are currently in service across the United States and Canada.
- The U.S. Environmental Protection Agency has concluded that methanol use in vehicles will cause no increase in formaldehyde levels in the atmosphere. The EPA has determined that, although methanol vehicles have higher formaldehyde tailpipe emissions, emissions from current conventional-fuel vehicles are coverted photochemically to formaldehyde to a greater extent.
- New technology to reduce formaldehyde tailpipe emissions is already being developed, so that, in the future, methanol vehicles should actually reduce current levels of formaldehyde in the atmosphere.
- There is growing recognition that as a transportation fuel, methanol and its derivatives have the capacity to make enormous contributions to clean air by reducing ground-level ozone, carbon monoxide, NOx and particulate emissions.

The GM methanol system is particularly desirable because it converts automatically from 100% unleaded gasoline up to 85% methanol fuel. Drivers will have the choice between operating on methanol, gasoline, or a mixture of both. The car will automatically sense the fuel mix and make the appropriate adjustments.

GMCL is working with other alternative fuels as well. We are providing technical assistance to Canadian companies which are retrofitting and modifying current and late model vehicles for natural gas and propane use. Vans from our Scarborough Plant are being retrofitted by outside companies with powerful lead-acid batteries which supply the vans with electric power.

General Motors of Canada also participates on a Steering Committee with the Ontario Ministry of Energy which is reviewing the feasibility of developing electric vehicles.

General Motors of Canada is experimenting with a host of available sources of energy. Our objectives are to reduce vehicle emissions, enhance fuel economy and ensure technology is available to adapt to situations of fuel shortages.


Lumina Methanol Variable Fueled Vehicle
Unique Components
FUEL PUMP SPEED CONTROLLER
CANISTER PURGE VALVE
BODY
INSTRUMENT PANEL
ENGINE MODIFICATIONS
PISTON RINGS
EXHAUST VALVES, SEATS
ENGINE OIL
THROTTLE BODY
HIGH FLOW
MATERIAL MODIFICATIONS
FLAME ARRESTOR
FUEL SENSOR CONTROL MODULE
CATALYTIC CONVERTER
STAINLESS STEEL FUEL TANK
CAPACITIVE FUEL SENSOR
FUEL RAIL ASSEMBLY
PRESSURE REGULATOR
INJECTORS

The Oshawa-built Methanol powered Lumina and its unique fuel components.

Clean Air

Reducing air pollution is an important objective of General Motors of Canada.

Factory stacks are sampled to ensure the efficiency of our pollution control equipment. All new stacks are certified by the Ministry of the Environment to ensure ambient air quality within our communities. Millions of dollars are spent to install control equipment as we build new plants and upgrade existing facilities to continually improve air quality.

The St. Catharines Foundry recently has completed extensive upgrades of its cupola emission control systems. A state-of-the-art microprocessor now controls the combustion of exhaust gases. Proven "top take-off" arrangements route gases from cupola furnaces to high energy scrubbers.

Scrubbers in many of our plants are used to reduce stack emissions by washing contaminants from the air stream. The water used in this process is contained and treated after the operation is complete. The result is cleaner air and improved reliability. "Baghouses" are also used in the exhaust stacks of several of our plants to remove contaminants from the air prior to discharge into the atmosphere.

GMCL has eradicated lead body filler joints from its manufacturing processes and now uses silicon-bronze instead of conventional solder welds to further reduce air emissions.

At GMCL, we are working hard to provide cleaner air.

Reducing Vehicle Emissions

General Motors' scientists and engineers have made numerous important advances in controlling vehicle emissions.

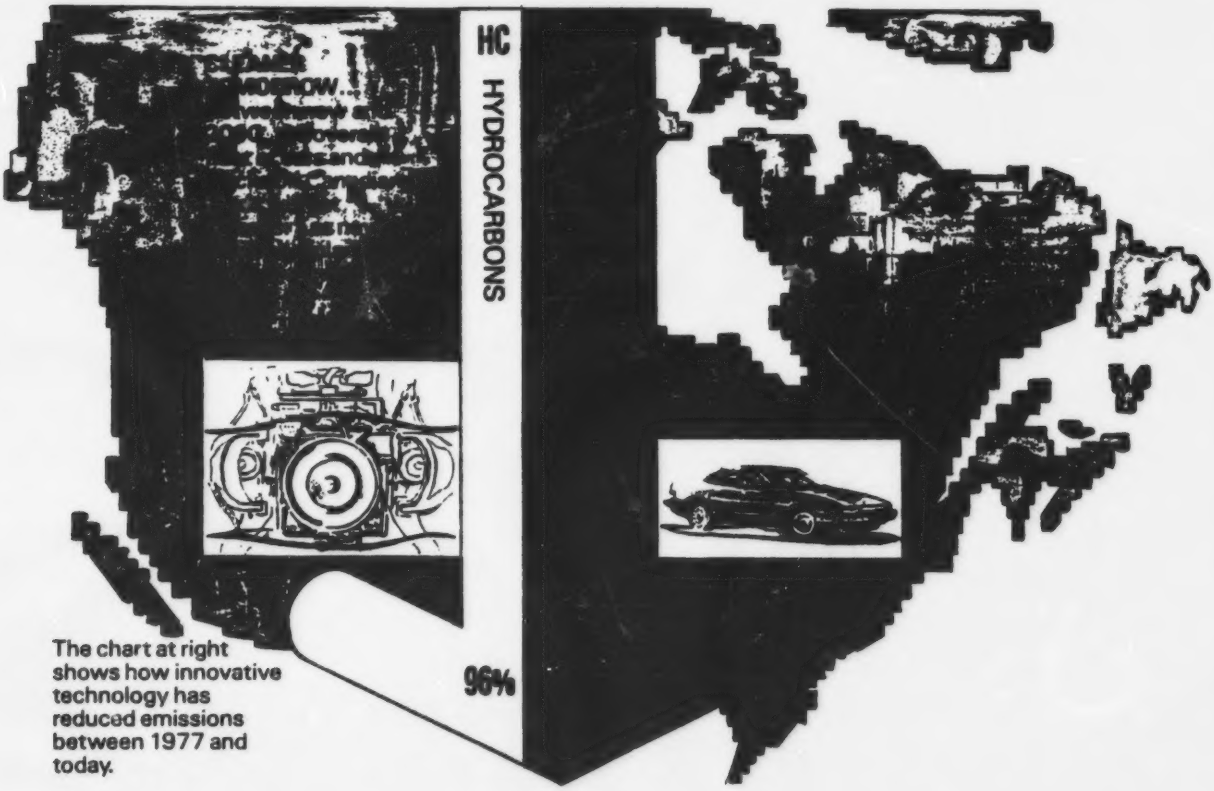
Today's cars contain emission control systems which have reduced emissions 90% on average from precontrol levels.

Testing done on GM vehicles shows emissions of hydrocarbons have been reduced 96 percent from precontrol levels. An overall reduction in carbon monoxides of 96 percent and a reduction of nitrogen oxides by 76 percent from precontrol levels have also been achieved. As newer vehicles replace older ones, overall emissions will decrease substantially.

These reductions in emissions are achieved through a number of technologies including catalytic converters, Positive Crankcase Ventilation, closed loop emission controls, fuel injection, electronic ignition, exhaust gas recirculation, and air injection.

General Motors supports the use of properly blended oxygenated fuels, such as methanol and ethanol. Motor gasolines that contain low levels of oxygenates not only improve octane levels, but may also reduce carbon monoxide emissions from vehicles.

We are continuing to pursue new technologies and new products to improve auto emissions and air quality. You can help too. Always use unleaded gasolines or recommended oxygenated fuels as described in your owner's manual. Have your vehicle serviced regularly to ensure that it is in top running order. Maintain your tires at the recommended pressure. If each one of us takes these small steps, the overall result will be a cleaner Canada.



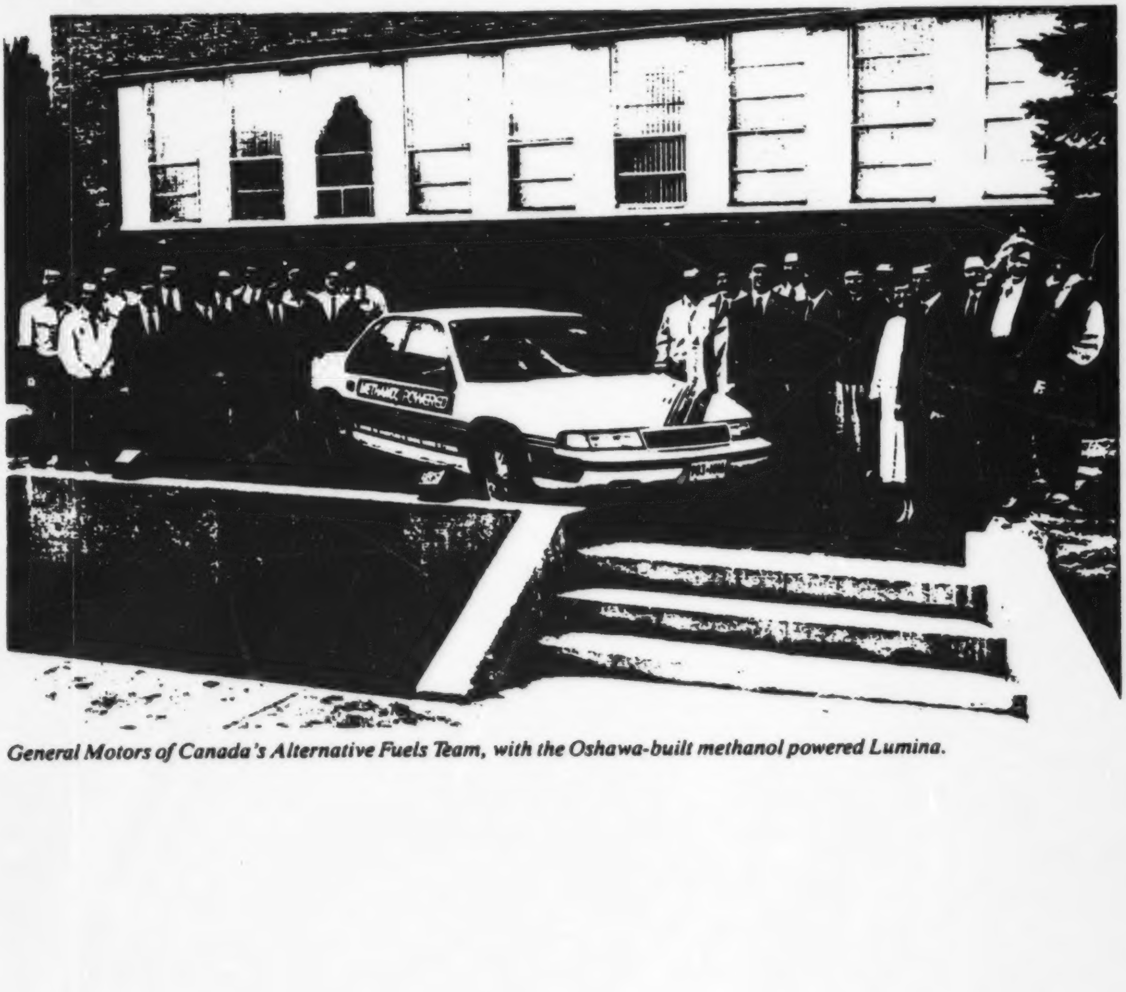
The chart at right shows how innovative technology has reduced emissions between 1977 and today.

Alternative Fuels

General Motors of Canada is addressing the challenge of alternative fuels with a number of important initiatives.

GMCL is leading the way with our methanol program. Methanol is made from natural gas. Canada is one of the largest methanol suppliers in the world, with eighty-five percent of all methanol production exported to world markets. Methanol may prove to be an effective tool in achieving cleaner air in North America's large cities. However, a number of important environmental, mechanical and distribution questions remain to be solved and General Motors is working hard to find the answers to these issues.

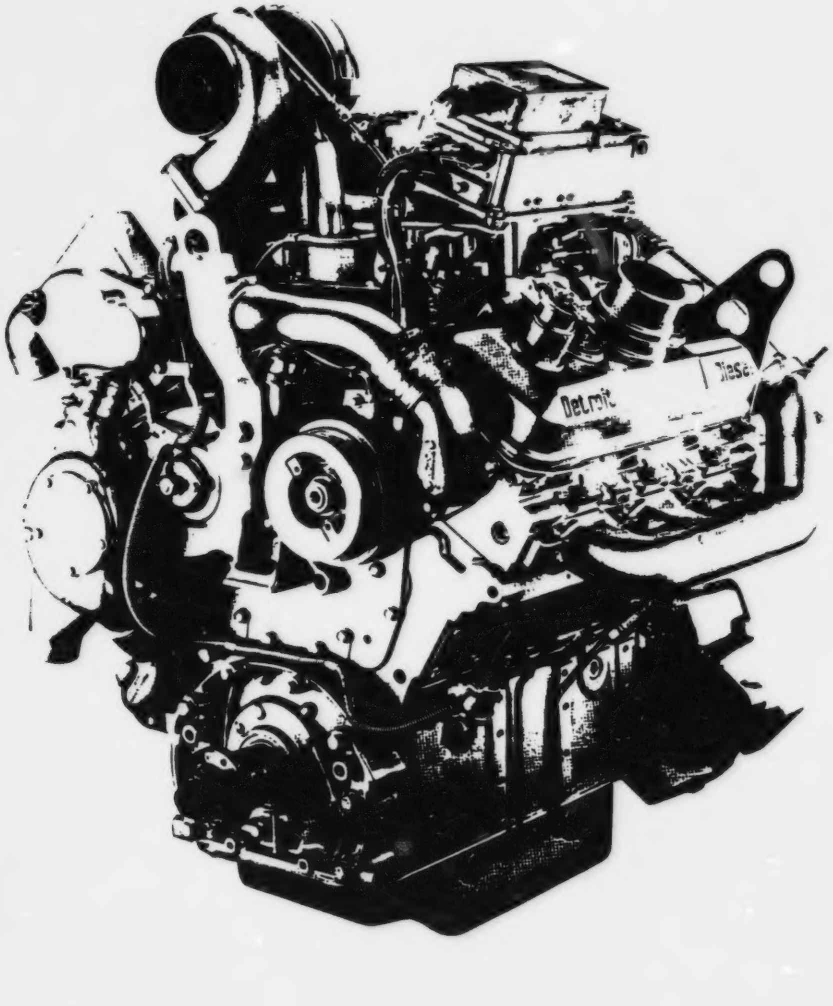
Since September 1988, GM has refitted 20 Corsicas to operate on a range of methanol/gasoline mixtures. Fifteen prototype Luminas built in Oshawa are being tested at GM's Kapuskasing, Ontario Cold Weather Test Facility, the Arizona Desert Proving Grounds, and the High Altitude Test Center in Denver, Colorado. These early prototypes are test vehicles for the 2,200 vehicles which General Motors of Canada will be producing for use in California.



General Motors of Canada's Alternative Fuels Team, with the Oshawa-built methanol powered Lumina.

DETROIT DIESEL

Methanol Fueled Engine Program


Detroit
Diesel

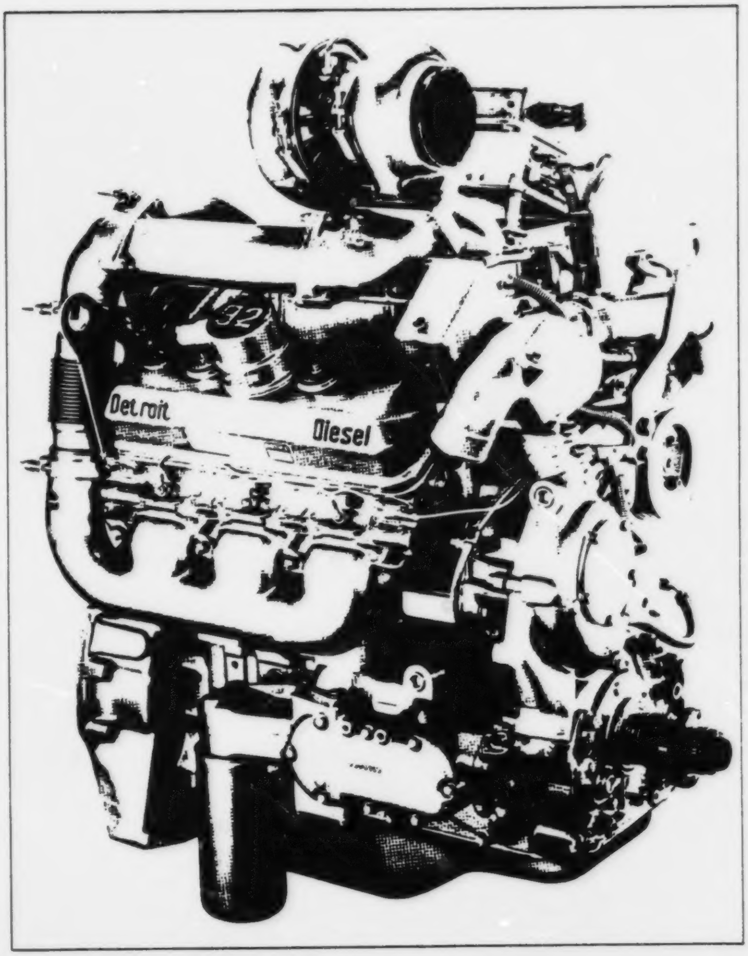
Our Commitment to the Transportation Industry

Detroit Diesel Corporation is committed to providing the very finest engines to the bus and truck industry. We are dedicated to upgrading and adapting our engines to meet customer needs while meeting or exceeding clean air standards and lessening our dependence on foreign oil. Our research with methanol fuel engines is being undertaken in this spirit.

Background

Alternate fuels for internal combustion engines are receiving increased emphasis due to concerns about air pollution and petroleum supplies. Alternatives most commonly proposed are alcohols and natural gas. For an alternative fuel to be practical, there must be producers and suppliers capable of providing the fuel when and where it is needed. In addition to being available and having a reasonable cost, a fuel must perform satisfactorily.

Methanol is a promising alternative for vehicular engines because it is a clean burning, relatively safe liquid with a reasonable cost. Today's methanol fueled engines may be the only viable technology available to meet the extremely stringent 1991 urban bus emission standards. The two pollutants which the EPA is most concerned about from diesel engines and two pollutants for which standards are lowered in 1991 are particulate matter (BSP) and nitrogen oxides (NOX).

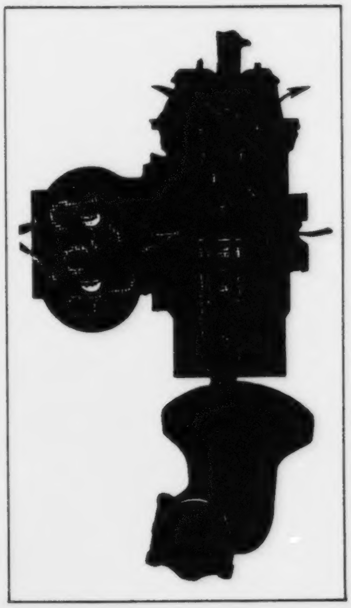


6V-92TA Methanol Fueled Engine

Advantages of Converting Detroit Diesel Two-Cycle Engines to Methanol

A four-stroke engine uses the piston to push combustion products out of the cylinder and to draw in fresh air (or fuel/air mixture). A two-stroke engine removes combustion products near the bottom of the piston stroke by use of a blower which blows in fresh air to scavenge (push out) the exhaust gas. Because there is considerable mixing during this scavenging process, the cylinder contents typically contain substantial hot exhaust gas when scavenging ends. This hot residual gas makes compression-ignition of low ignition-quality fuels such as methanol relatively easy, especially if the quantity of residual is increased when necessary. Therefore, two-stroke engines have an advantage in compression-igniting fuels of poor ignition quality. In addition, the technology of burning methanol in a Detroit Diesel engine was aided by the use of advanced technology systems Detroit Diesel has developed for commercial applications. These technologies include the Detroit Diesel Electronic Control (DDEC) system, the full bypass air system and the glow plug starting system.

2-Cycle Piston

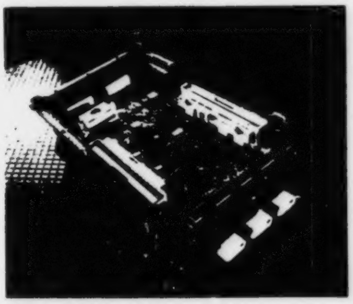


Detroit Diesel Electronic Controls (DDEC)

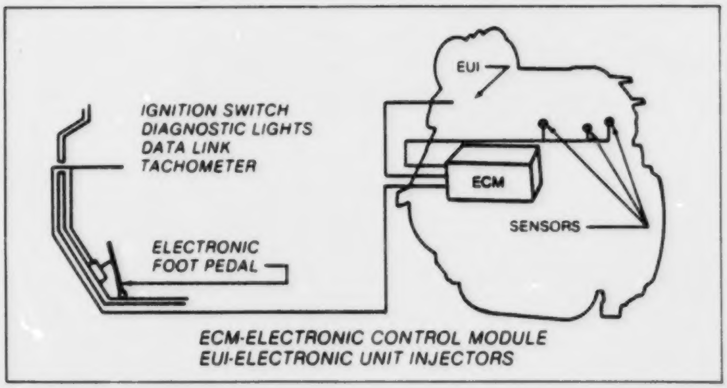
Undoubtedly, the greatest single advancement in diesel engine technology during the 1980's has been engine electronics. Detroit Diesel pioneered engine electronics in 1985 with the introduction of DDEC. The purpose of electronics is to manage engine operation under continually varying conditions to optimize performance and economy while meeting emission standards.

Its major components are the Electronic Control Module (ECM) and the Electronic Unit Injectors (EUI). The ECM is the brain of the system, receiving electronic inputs from the driver as well as engine mounted sensors that provide information electronically, such as oil pressure and temperature, speed and intake manifold pressure. This information is used to control both the quantity of fuel injected and injection timing.

The electronics contain a PROM (Programmable Read Only Memory) which is mounted in the ECM



Electronic Control Module (ECM)



and encoded with your engine's performance characteristics. Included in the PROM is information to control the horsepower rating, torque curve, maximum engine speed and optional protection devices. The ECM processes this information and sends electronic signals to the Electronic Unit Injectors where the precise amount of fuel is injected.

Electronic Unit Injector

The electronic unit injector works on the same basic principle as the mechanical unit injector with the simple addition of an electronically controlled solenoid valve that meters and times fuel input.

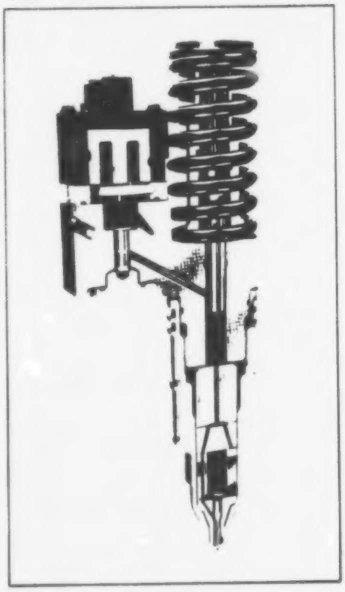
Bypass Air System

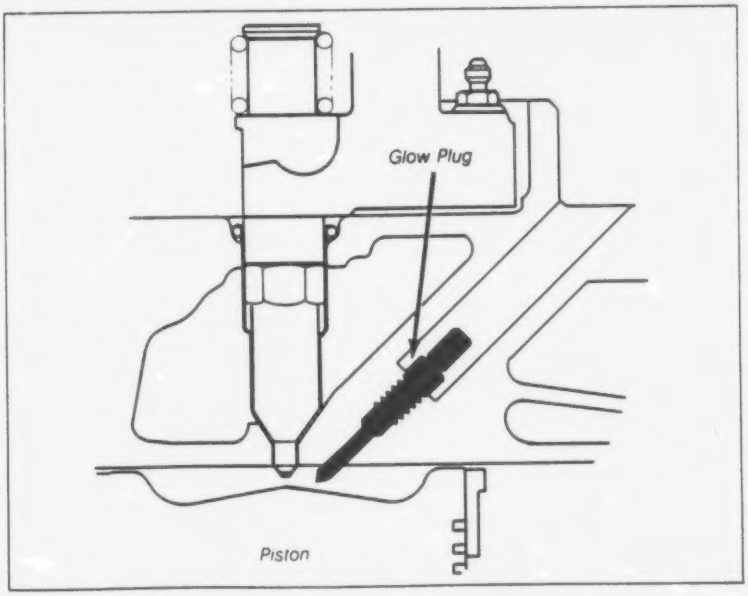
The bypass air system is a key component for correct metering and mixing of fresh air and retained exhaust gases in order to achieve the necessary methanol compression ignition temperature. The bypass air system is controlled by an electric/pneumatic system which senses engine accessory and vehicle operating conditions.

Glow Plug System

The glow plug system is similar to systems developed by General Motors for use in passenger cars but has been modified by DDC for heavy duty engines and for use with DDEC. Electrically heated glow plugs are presently used to start the engine and to assist low speed and light load operation. DDC is continuing to study the ignition process with the objective of minimizing the need for glow plugs. Research and development is also continuing in other areas including fuel pump, injectors, valve seats and lubricating oil.

Electronic Unit Injector (EUI)





RTA CLEAN AIR 1
3008

On the Road Testing

In 1983, the first and longest running Detroit Diesel methanol-powered bus, Methanol 1, began service at Golden Gate Transit in California. Today it has accumulated over 60,000 miles of service. Detroit Diesel methanol-powered transit buses have also been operating in Jacksonville, Fl., Medicine Hat, Alberta, Canada and Winnipeg, Manitoba, Canada.

In 1987 Detroit Diesel Corporation provided nine (9) experimental methanol-fueled 6V-92TA engines to two transit bus pilot programs on opposite coasts of the United States. These buses all went into service in April, 1988.

New York put six (6) methanol-fueled, Detroit Diesel powered buses in regular passenger service and in Riverside, California Riverside Transit Agency introduced three (3) Detroit Diesel methanol-powered buses named Clean Air 1, 2 and 3.

Both the New York City and Riverside methanol-fueled programs are beginning three-year, real world testing which will provide further data on performance, fuel economy, maintenance and repair requirements, as well as public acceptance of the buses.

By fall of 1988, an additional 37 Detroit Diesel 6V-92TA methanol-powered buses will be placed in service with transit agencies in three U.S. cities.

Some of the experimental methanol-powered buses placed in service will also be used for exhaust catalyst development. The catalyst is similar to those used on passenger cars and acts to effectively remove unburned methanol, formaldehyde, carbon monoxide and particulates.

DETROIT DIESEL
CORPORATION
13400 Outer Drive, West / Detroit, Michigan 48239-4001
Telephone 313-592-5000
Telex 4320091 / TWX 810-221-1649

6SA319 8807 As technical advancements continue, specifications will change. Litho in USA

MR. ORMAN

Dear Sir,

I am a grade 9 student at Lorne Akins J.H, in St. albert. I am writing to you to express my concern over the developement and operation of a sour gas ~~pass~~ processing plant within 2 miles of my residence. Since this plan will emit **hazardous** gasses contributing to **acid rain**, and in addaition, since sour gas contains **hydrogen sulphide, a lethal** substence. In the event of a plant failure, fire or explosion this could hav a **CATASTROPHIC** effect on my community, I am writing this letter to ask you what **you** are doing to **protect** the EnviroNMent and my community.

very truly your,

Leah C. Ber~~tsch~~

Leah C. Bertsch.

53 Butterfield dr
St, Albert, albert
Canada T8N 2W6

30 Nov 1990

Re: Clean air strategy, Alta.:

The purpose of monitoring and regulating air quality must stem from concern for health, and envirionmental damage. The current approach does not jibe with this because Alberta Environment concerns itself only with standards and measurements of ~~particula~~ specific pollutants, not with overall air quality. For example, many pollutants with known and unknown health effects are simply ignored. This system is designed around pollutants and their producers, not around the needs of the people and the environment.

Sincerely,

Mitch Bronaugh

Mitch Bronaugh
10984 122 St
Edmonton, Alta.
T5M 0B1

MITCH BRONAUGH

IMPLICATIONS OF NORTHERN ALBERTA FORESTRY PROJECTS FOR THE ENERGY SECTOR: AIR POLLUTION CONSIDERATIONS

Although pulp mills do emit some of the same air pollutants as those associated with the oil and gas industry, other effects of their activities promise more serious difficulties for energy companies and the public due to air pollution problems. One area of concern is the increased air pollution concentrations which will result from removal of portions of the forest. The other is the terms of Daishowa's (and presumably Alpac's) FMA which states that the primary purpose of the area is to grow pulp wood for the FMA holder, and decrees that other industrial users must compensate them for any damage to "their" trees.

I include with this note (1) a paper by Mayer and Ulrich describing very different sulfur deposition rates in forests as opposed to cleared land; (2) a paper by my colleague Tammy Warawa which documents detrimental effects on Alberta trees from sulfur deposition (including reduced growth rates), quoting ADRP sources; (3) an excerpt from the Daishowa FMA outlining the FMA holder's right to compensation for damage to trees, including reduced growth rates; (4) a copy of an Alberta Forestry map showing the extent of existing and proposed FMA's; and (5) an excerpt from a paper by Outrim and Evans with maps indicating the extent of heavy oil deposits in Alberta.

As the above mentioned documents show, (1) most of Alberta's famed heavy oil deposits--well over one trillion barrels of bitumen--directly underlie the Daishowa and proposed Alpac FMA's; (2) the FMA holder will be entitled to compensation by an energy company for any damage to trees caused by the energy company's activities, including tar sands plants;3damage such as described in the FMA agreement has already been documented near sour gas plants in Alberta; (4) effects of air pollutants, including effects on remaining trees, will be incresed by reduction of forest cover, since trees remove pollutants from the air. As the enclosed article from the Calgary Herald reports, oil companies are already complaining that FMA holders are charging them much more for damages than the Crown does outside FMA's, which is bad for any oil company which is not a subsidiary of the FMA holder. It is also bad for the tax payers, because the money is paid to a foreign owned corporation, not into the public purse.

Atmospheric Environment Vol. 12, pp. 375–377. Pergamon Press 1978. Printed in Great Britain

INPUT OF ATMOSPHERIC SULFUR BY DRY AND WET DEPOSITION TO TWO CENTRAL EUROPEAN FOREST ECOSYSTEMS

R. Mayer and B. Ulrich

Institut für Bodenkunde und Waldernährung der Universität Göttingen,
Büsgenweg 2, D-3400 Göttingen, F. R. Germany

(*First received* 13 *June* 1977)

Abstract—The total input of atmospheric sulfur to a beech and a spruce forest in the Federal Republic of Germany has been measured over a period of 6 years. The contribution of dry deposition to the total input was determined indirectly by comparing seasonal changes in the sulfur flux coupled with precipitation beneath the canopy of the deciduous beech forest. As a result of these investigations seasonal and annual sulfur fluxes are reported corresponding to removal rates of atmospheric sulfur. The experimental data show clearly that the removal rates depend upon the quality of the atmosphere land interface, in forested areas from the tree species forming the canopy. The 6-years average of total deposition on bare soil is 23 kg S ha^{-1} y^{-1}, on a beech forest 47–51 kg S ha^{-1} y^{-1}, on a spruce forest 80–86 kg S ha^{-1} y^{-1}. Based upon the experimental results the role of the forest vegetation in the removal of sulfur from the atmosphere in the area of the Federal Republic of Germany is considered. The figures indicate, that at least 50% of the total sulfur deposition takes place on forested areas which cover only 28% of the total land surface.

INTRODUCTION

Deposition of most ion species, including SO_4^{2-}, measured in the precipitation below the canopy of a forest stand exceeds that measured above the canopy. The increase in the element flux during canopy passage of precipitation is due to dissolution of substances when plant surfaces (leaves, needles, bark) are wetted, or to dry fallout reaching the forest floor subsequently being dissolved in the rain water within the collector. The origin of these substances has been attributed to biological and meteorological sources:

(1) Metabolites from the internal turnover of the trees as, e.g. solutes carried by the transpiration stream to the leaf surfaces, substances resulting from assimilation and respiration processes, or litter particles being decomposed.

(2) Dry deposition of airborne particles, aerosols and gases. This flux depends upon the deposition velocity of substances present in the atmosphere which is controlled by the surface resistance of the canopy, i.e. its physical structure and surface conditions. It has therefore been called 'filtering' by ecologists, since the vegetation cover acts as a filter for atmospheric substances, and these may contribute significantly to the element balance of an ecosystem.

DESCRIPTION OF SITES AND METHODS

The data presented here are resulting from investigations on the element balance of forest ecosystems in central Europe. Research sites are a beech forest (*Fagus silvatica*, age: 125 years) and a spruce forest (*Picea abies*, age: 85 years) located at an altitude of about 500 m a.s.l. in a densely forested mountainous area without large industries or cities about 40 km northwest of Göttingen. Mean annual precipitation is about 1000 mm. Average SO_2-concentrations in the atmosphere range from 5 to 10 μg SO_2 m^{-3} during summer and from 10–20 μg SO_2 m^{-3} during winter. A detailed site description is given by Ellenberg (1971), the methods for measuring the amount and chemical composition of precipitation were: (a) 15 raingauges below the canopy of both forest stands and on a non-forested area close to the forest sites, (b) 3 rain-gutters of 1.5 m^2 surface area below the canopy of both forest stands, (c) stemflow collectors fixed around the beech stems on a total area of 800 m^2.

No measurements were taken to separate wet and dry deposition, but raingauges under the canopy collecting precipitation for chemical analysis were covered by a screen to keep out coarse litter. During winter larger collectors were used to get snow samples.

Samples were taken from the collectors after each precipitation period and stored in a deep-freezer. Chemical analysis was done on monthly samples. Sulfur was determined after separation of phosphate, fluoride and Fe^{3+} as SO_4^{2-} by colorimetry on a Technicon Auto Analyzer using SPADNS as complexing agent. The investigations have been made without interruption since November 1968.

RESULTS

In Table 1 the deposition (wetfall plus dryfall) of S measured on the open plot and under canopy is

Table 1. Deposition of sulfur (dryfall plus wetfall) and precipitation

		1969		1970		1971		1972		1973		1974	
		W	S	W	S	W	S	W	S	W	S	W	S
BS on a non-forested area (bare soil)†	Kg S ha^{-1}	12.3	12.5	14.0	12.9	9.2	10.5	9.5	14.1	13.6	8.0	10.4	12.5
CP below beech canopy*	kg S ha^{-1}	39.2	33.5	27.6	25.0	18.1	16.9	24.7	22.5	21.9	21.0	21.8	32.2
CP below spruce canopy	kg S ha^{-1}	66.5	41.2	46.7	41.3	34.0	29.6	42.4	34.4	55.6	29.5	44.1	53.1
Precipitation	l m^{-2}	436	530	730	651	399	370	346	550	435	450	386	602

* Stemflow included. W = Winter (November–April), S = Summer (May–October).

† Soil adsorption neglected.

given for different seasons and years. Sulfur was found to be nearly exclusively in the form of SO_4^{2-}.

The sulfur flux below the canopy considerably exceeds the input from the atmosphere to the non-forested area (bare soil). In the case of the beech forest the difference between both of these fluxes may be taken, during the winter months, as an additional input from the atmosphere. Leaching of metabolites should be negligible when the canopy is defoliated and the physiological activity of the beech as well as litter fall is largely reduced. The only source remaining for the observed flux increase is dry deposition from the atmosphere.

Mayer and Ulrich (1974) have estimated dry deposition ('filtering') during the vegetation period (May–October) by using the same ratio between total deposition on bare soil and additional dry deposition on the canopy for the winter as well as for the summer months. The same flux ratio was later applied to an evergreen spruce forest within the same area (Ulrich *et al.*, 1977). With this approach, assuming the same 'filter efficiency' of the canopy whether leaves are present or not, the additional dry deposition to the beech forest during the summer is most likely underestimated.

In the 6-year period under investigation the estimated input of sulfur by dry deposition accounted, during the vegetation period, for more than 75% of the sulfur flux increase during canopy passage of precipitation (Mayer and Ulrich, 1977). It follows, that, within the period May through October, leaching of metabolites from the canopy contributes less than 25% of the flux increase.

Systematic errors may lead to an overestimate of the input from the atmosphere when, during the winter months, decomposition of plant parts or litter particles occurs. In the case of sulfur this source of error is most probably negligible due to the relatively small S content of the biomass. The total annual litter fall of the beech forest (3.2 kg S ha^{-1} y^{-1}; Mayer and Ulrich, 1974) yields only about 6% of the S-flux coupled with precipitation below the canopy.

For the same reason it may be concluded, that uptake of S (or SO_2) through the stomata does not play an important role in the sulfur balance of the forest stands provided there is no transfer of sulfur from the leaves to the roots and to the soil against the transpiration stream—which again is very unlikely. The annual increment in the biomass of the beech forest is less than 1 kg S ha^{-1} y^{-1} (Mayer and Ulrich, 1974). Based upon this reasoning, the mean annual sulfur input from the atmosphere by wet and dry deposition, IN_{aa}, to the beech and the spruce stand within the period November 1968 through October 1974 was calculated in the following way:

(1) Maximum values:

$$IN_{aa} = CP_{(a)} = CP_{(w)} + CP_{(s)}$$

where $CP_{(a)}$ is the annual sulfur flux below the canopy. Contribution of internal turnover as well as net uptake of S by the leaves and translocation to the tree are assumed to be negligible.

(2) Minimum values:

$$IN_{aa} = IN_{aw} + IN_{as}$$

with

$$IN_{aw} = CP_{(w)}$$

and

$$IN_{as} = BS_{(s)} + 0.75\,(CP_{(s)} - BS_{(s)})$$

where the subscripts *s* and *w* indicate summer (May–October) and winter (November–April) periods. *CP* is the sulfur flux below canopy. *BS* is the sulfur flux on bare soil. The difference (*CP* − *BS*) gives the flux increase during canopy passage, 75%, of which is taken as (minimum) dry deposition.

Table 2. Mean deposition of sulfur (wetfall plus dryfall) IN_{aa} within the period November 1968 through October 1974

		kg S ha^{-1} y^{-1}	mg S m^{-2} d^{-1}
On a non-forested area (bare soil)		23.3	6.4
On a beech forest	maximum	50.8	13.9
	minimum	47.4	13.0
On a spruce forest	maximum	86.4	23.7
	minimum	79.8	21.9

Precipitation (Nov. '68–Oct. '74): 981 l m^{-2}; 30-year average: 1030 l m^{-2}

Results are given in Table 2. The data may be used for a rough estimate of the annual sulfur deposition on the area of the Federal Republic of Germany:

Total surface F.R.G.	24.7×10^6 ha
including	
non-forested area	17.7×10^6 ha
forested area	
—coniferous forests	4.2×10^6 ha
—deciduous forests	2.8×10^6 ha

If we take the mean deposition rates from Table 2 the annual sulfur deposition is calculated:

Deposition on non-forested areas	410×10^6 kg S
on forested areas	490×10^6 kg S
including	
—on coniferous forests	350×10^6 kg S
—on deciduous forests	140×10^6 kg S

It must be stated, that this estimate can only be approximative for a larger deposition is found close to the emittents (industries, cities), and the distinction of the total land surface into three surface types is an oversimplification. Nevertheless it may give a good idea of the relative importance of the forest in the removal of sulfur from the atmosphere. The total anthropogenic emission of sulfur within the Federal Republic of Germany in 1970 is estimated to 1800×10^6 kg (VDI-Berichte, 1972). Estimates of the annual emission of gaseous sulfur into the atmosphere by natural processes (mainly biological decay) are very uncertain. Taking the figures reported by Granat *et al.* (1976) we calculate 6×10^7 kg S from natural sources for the land surface of the Federal Republic of Germany, i.e. an amount negligible compared to the industrial emission.

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As requested in your form letter, I wish to present to you some additional information relating to the submissions of myself and Mitch Bronaugh and also my recommendations concerning the AL-PAC proposal.

As you are aware, our focus has been on Sulphur deposition rates, soil sensitivity, the filtering effects of forests, and the possible consequences of the AL-PAC operation on Alberta soils. The work I will be presenting points to a dire need for further field work to be done before we make any hasty decisions. This may, in the opinion of some, be uneconomic. However I can only hope that we are wealthy enough as a province to be able to make an educated and informed decision, even if this requires more time.

One thing which has become very clear is that there are no measurements for the area in question. No one can say with any confidence just what the deposition rate is.

Following is a sampling of the other comments and conclusions and recommendations of the people working in the monitoring field in Alberta.

J.M. Mayo, 1987 -- The Effects of Acid Deposition on Forests, Acid Deposition Research Program, vol. 9 -- P. 56; Soils -- Page 68

"5.1 ACID DEPOSITION RESEARCH IN ALBERTA

The considerable amount of acid deposition research in Alberta is varied and detailed. Table 13 gives examples of the research dealing with acid deposition on forests that has appeared in journals in the open literature. There is considerably more in various reports funded by industry and government. No attempt has been made to summarize these. However, as these industry and government papers appear in journals, they will eventually constitute a large body of information. As can be seen in Table 13, and as noted earlier, the major emphasis has been on the effects of S deposition near point sources such as sour gas plants along the Rocky Mountain foothills and the Alberta Oil Sands near Fort McMurray.

There is evidence of soil acidification with aluminum and manganese becoming soluble (Baker et al. 1977;; Nyborg et al 1977; Addison and Puckett 1980; and Addison 1984). However, Lore (1984) found no evidence of soil ph change downwind from a sour gas plant near Pincher Creek, Alberta. This study was on loam to clay loam soils not likely to be sensitive to acid deposition. Clearly, there has been a reduction in photosynthetic capacity of the major tree species near these gas plants (Legge et al. 1978; Legge 1980 et al. 1981; Legge 1982; Addison et al. 1984; Amunson et al 1986; and Legge et al. 1986), and there have been effects measurable at the biochemical level such as chlorophyll destruction (Malhotra 1977; Harvey and Legge 1979). It appears that forest growth may also have been reduced (Legge, 1980; Legge et al. 1984; and Legge et al. 1986). These data and many more that have appeared in the various reports cited earlier clearly indicate that Alberta has a problem caused by industrial pollution sources as well as by non-point deposition from farming activities. This clarification of whether these effects are direct or indirect depends on a better knowledge of basic forest processes; further research is required.

5.2 RECOMMENDATIONS FOR RESEARCH

The following are recommendations for research directions in Alberta.

5.2.1 Integrated Studies and Modelling

Integration is necessary and it is recommended that more integrated studies involving soil scientists, soil microbiologists, plant physiologists, ecologists, and atmospheric scientists be undertaken. A modelling approach would be desirable. It should be understood that modelling cannot be just an attachment to existing research programs, but must be the goal from the out set. This requires that funding be sufficient for the modelling effort, including the research necessary to provide model input, and the means with which to validate the model in the real world. Too often all of these steps are not undertaken, the result being a model that has not been fully tested. An integrated, model-oriented study of a forest ecosystem on an acid sensitive soil near a known source of acidic pollution is recommended. This also requires that a good control site, free from pollution, be selected, and that fundamental research into basic ecosystem functioning must be supported. The Oil Sands region of northeastern Alberta or the Whitecourt area of west-central Alberta are two possible locations for such a study. In view of the proposed future development of the oil Sands, it is recommended that such research begin now, rather than after expansion has begun."

"In Alberta there is insufficient information concerning the proportions of acidic deposition due to dryfall and to wetfall. There is likewise insufficient understanding of the interactions of these different forms with soil."

Kimberly Sanderson, Environment Council of Alberta, March 1984 -- Acid-Forming Emissions - Transportation and Effects, -- Page 39

"Short range, or local transport (less than 100 kilometres) has been studied in Alberta for some time; however, the methods used have not been consistent, leading to results which are sometimes contradictory and un-reproducible, and often controversial. Despite problems in some Alberta studies, there are data on the harmful effects of SO2 on vegetation; as well, copious evidence from studies elsewhere has shown the effects of acid deposition on both aquatic and terrestrial ecosystems. Such information should provide a note of caution to the regulators and decisionmakers here if environmental protection is to be given a high priority."

P.J. Kociuba, D.A. Faulkner, R.F. Hopkinson, Atmospheric Environment Service, February, 1984 -- Sulphur Deposition Modelling in Western Canada -- Page 37

"However, the many data gaps in the precipitation chemistry data and questionable quality of some of the data made most comparisons invalid or uncertain. The 1978 CANSAP and Alberta PQMP data for western Canada provided an inadequate verification tool for the sulphur budget. No measurements of dry deposition or air concentrations exist for 1978 and comparisons with modelled values are not possible."

Western Canada Long Range Transport of Air Pollutants Technical Committee, December, 1985 -- A Review of Mesoscale Modelling for application to Western Canada --Pages 7 and 8

"No reliable accuracy (uncertainty) assessment has yet been done"

"The third year of the action plan will be taken up with the field study designed during year two. Once data from the field program are available, further model runs should be executed. Field data should then be analyzed and model performance quantified."

NB: This plan has not yet been carried through.

AL-PAC E.I.A. Review Board Transcripts, 1989, 1990 -- Page 7107, Line 7

> Concord Scientific Corporation is currently undertaking air monitoring in the Fort McMurray area. They are the main contractor for the O.S.L.O tar sands expansion E.I.A. Although Mr. Caton of Concord Scientific used the figure of 10 kg/ha/yr (from the A.D.R.P.) in his submission on behalf of the Prosperity Environmental Association, he did state that "Nobody really knows what the number is".

Here is a sampling of some studies by authors who did field work whose results seem to differ from the modelled results obtained by the A.D.R.P.

Marvin Nyborg, Alberta Environment, June, 1978 -- "Fate of Emitted Sulphur Dioxide" -- Pages 2 & 3, 63 - 68

- please see attachment number 1

Hua Hsu, and G.W. Hodgson, 1977 -- Process of Alberta Sulphur Gas Research Workshop III, Research Secretariat, Edmonton, Alberta -- Page 263

- please see attachment number 2

In his study, Mr. Nyborg points out, among other things, that total sulphur deposition is a more relevant datum than measurements simply of soluble sulphate. Hua Hsu and G.W. Hodgson support his findings

Furthermore, Jim Lore and Associates, while conducting a study for the Caroline area Gas Development Group in 1988, used only the traditional soluble suphate test in their study.

While the data gathered by the many studies of acid forming emissions and their effects is in no way incorrect, the studies are incomplete. Many important areas of study have been simply overlooked, and many of the results present incomplete and misleading pictures of the true situation -- especially in Northern Alberta.

One thing we do know -- according to the AL-PAC study,the area proposed for the mill site contains very sensitive soils with an extremely small buffering capacity in some cases. We know that Alberta discharges large quantities of possibly acid-forming emissions We know that a loss of treed areas results in an increase of acid deposition over the remaining areas.

Although off topic, I feel compelled to bring to your attention another matter with possibly disastrous implications -- When the modelling work was done on 7Q10 river flows (needed to determine B.O.D.) the data input was based on current river flows with intact forest cover. the trees behave as a kind of a sponge insofar as water runoff is concerned. When the trees are removed, the sponge effect is removed, and as a result, there is a more rapid runoff in the spring, with much lower flows in the winter. This could seriously alter the 7Q10 figures used in the model. Considering the fact that B.O.D. levels are already a major concern fo everyone involved, this is an issue that must be addressed.

Another disturbing aspect of the mill is the question of its socio-economic impact. While being touted as a boon to Alberta, the plant's profits will be diverted outside the province, having only limited benefit for Albertans. Statistics Canada reported in 1986 that 64% of corporate profits in Alberta were going to foreign corporations This is a disturbing trend, which would not be tolerated in any other country, and is a trend which most Albertans would prefer to see reversed, rather than accelerated.

It has been proven time and time again that heavily subsidized mega-projects are seldom in the interest of the taxpayer, and this project appears to belong in the "subsidized" category. The Review Board's own independent panel has noted that the economics benefits of this project will be far less than advertised.

The only recommendation I can make is to put in effect a 3 - 5 year moratorium on the development of this mill, while the proper studies are undertaken. With the rather limited economic benefits to Albertans of the project, we cannot gamble on possible degradation of our land base. We must proceed with extreme caution.

January, 1990

(2) A withdrawal shall take effect

(a) on the date the notice of withdrawal is given by the Minister to the Company, or

(b) where the notice given states that the withdrawal shall take effect at a future date, on the date stated in the notice.

(3) In the event from time to time of any withdrawal or withdrawals of land from the forest management area by the Minister:

(a) for disposition to users other than the Crown except where that use has been designated for exemption by the Minister, the Company shall be entitled to reasonable compensation from the users for any loss of profit or other damage or loss suffered by the Company, including by way of example, but without limitation, damage to timber, improvements, regeneration, forest growth, or to its operations on the forest management area resulting from such withdrawal;

(b) for use by the Crown, and for uses designated for exemption by the Minister, wherein the cumulative net aggregate area withdrawn does not exceed 3% of the net forest management area, the Minister shall determine the compensation and arrange for reimbursement to the Company for the actual loss or damage resulting from such withdrawal to any improvements created by the Company's efforts, but not for any loss of profit, inconvenience nor increased costs reasonably incurred by the Company in harvesting an equivalent volume of timber elsewhere;

(c) for use by the Crown, and for uses designated for exemption by the Minister, wherein the net aggregate area withdrawn on a cumulative basis does exceed 3% of the net forest management area, the Minister shall determine the compensation in respect of such excess and arrange for reimbursement to the Company, including damage to timber, improvements, regeneration, forest growth, or to its operations on the forest management area.

(d) if the administration and control of any of the lands comprising the forest management area is transferred to the Crown in right of Canada, the Company shall be entitled to compensation under subparagraphs (b) and (c) as if the lands were withdrawn for use by the Crown.

(4) For the purposes of applying subparagraphs (3)(b) and (c), the net area for the initial forest management area shall be established and agreed upon by both parties to be effective on the commencement date of this Agreement and shall be recalculated at such time as the "5 year reserve area for second mill" is added pursuant to paragraph 3(4).

(5) For purposes other than applying subparagraphs (3)(b) and (c), the net area shall be adjusted annually on the anniversary date of this Agreement in accordance with all exceptions, additions and withdrawals to the forest management area.

RIGHTS OVER THE LAND

7. (1) Subject to all the terms and conditions of this Agreement the Minister grants to the Company the rights, during the term of this Agreement, to establish, grow and harvest timber on the forest management area on a perpetual sustained yield basis, with such rights to include,

(a) the right during the term of this Agreement to enter and occupy the forest management area for the purposes referred to in subparagraphs (b), (c), (d) and (e);

(b) the right during the term of this Agreement to grow, cut and remove deciduous timber on and from the forest management area;

(c) except as otherwise provided in this Agreement, the right during the term of this Agreement to grow, cut and remove coniferous timber on and from the forest management area;

(d) the right during the term of this Agreement to carry out reforestation and other programs that are approved by the Minister in accordance with this Agreement; and

(e) the right during the term of this Agreement to construct, operate and maintain roads, wood concentration yards and other installations necessary and incidental to the Company's logging and silvicultural operations on the forest management area.

(2) For the purpose of interpreting the Surface Rights Act, or as amended from time to time, the Company is an occupant of the public lands comprising the forest management area.

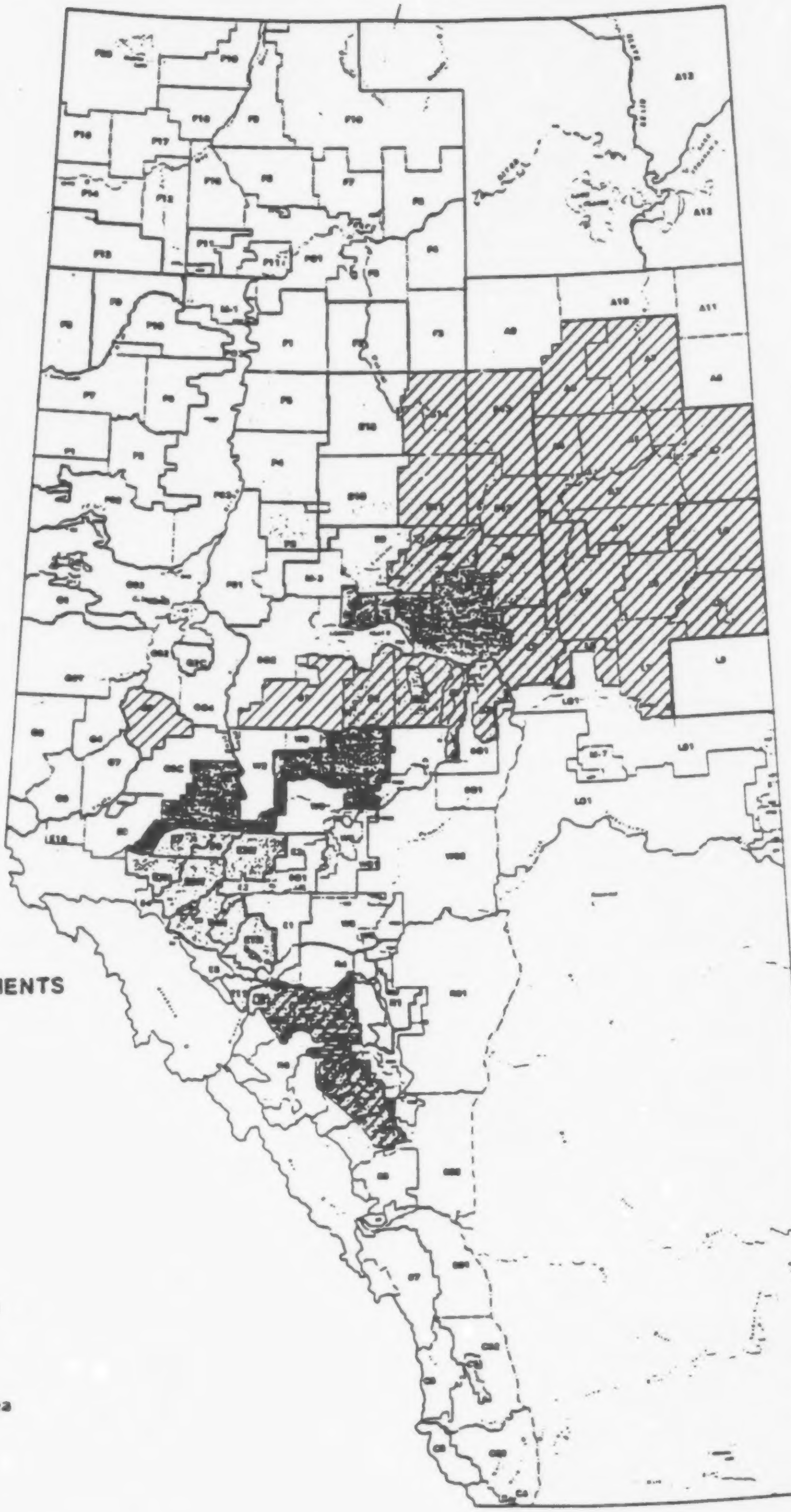
(3) The Minister shall cause land dispositions required within the forest management area for work such as roads, bridges, and other necessary works incidental to the Company's logging and silvicultural operations to be issued to the Company without any dues, fees or rental charges being paid but such dispositions shall otherwise be subject to any pertinent regulations.

(4) Notwithstanding subparagraph (3), the Company may obtain sand and gravel needed for its operations under this Agreement from any vacant public land on the forest management area pursuant to the Surface Materials Regulation, subject to the payment by the Company of all required fees and royalties. In no case, however, shall the Company have to pay fees or royalties for in situ right-of-way material located and used where it is found within the right-of-way.

8. (1) It is recognized by the Minister that the Company's use of the forest management area for growing and harvesting timber is to be the primary use thereof and that it is to be protected therein, but in keeping with the policy of providing for multiple uses of the same public land, the Minister reserves all land rights on the forest management area not specifically given hereby, including by way of example, but without limiting the generality of the foregoing:

(a) the right of others to travel, hunt, fish and otherwise use the said lands for recreational purposes, subject only to any necessary restrictions approved by the Minister for the purpose of prevention of accidents, fire control and seasonal protection of roads;

(b) the right to authorize any person to conduct any work in connection with or incidental to geological or geophysical exploration pursuant to the Mines and Minerals Act, or the Exploration Regulation; provided that the Company shall be entitled to reasonable compensation, from the person conducting the exploration, for any loss or damage suffered by the Company and resulting from such exploration including by way of example but without limitation, for any damage to timber, forest growth, regeneration, improvements



EXISTING & PROPOSED FOREST MANAGEMENT AGREEMENTS

▨ Indicates Proposed FMAs

☐ Procter & Gamble
▨ Canadian Forest Products
☐ Weldwood (Hinton)
☐ Weldwood (Slave Lake)
☐ Alberta Energy Company
▨ Slave Lake Pulp
▨ Slave Lake Pulp Reserve Area
☐ Weyerhaeuser Canada
☐ Daishowa Canada
☐ Daishowa Canada Reserve Area
▨ Alberta Pacific
▨ ANC Timber
▨ Sunpine

Proposed F.M.A. Boundaries subject to change.

February, 1990

GEOLOGY AND RESERVES

Alberta's Oil Sands Reserves And Their Evaluation

By C. P. OUTTRIM, and R. G. EVANS,
Energy Resources Conservation Board,
Calgary, Alberta

ABSTRACT

Estimation of crude bitumen in place in Alberta's oil sands deposits is a function of the method of evaluation and the criteria applied (e.g. minimum saturation cut-off). These, plus economic and other factors, contribute to the evaluation of recoverable reserves by mining or by in situ methods. The paper describes the reserves estimates carried by the ERCB and the evolution over a number of years of the methods and criteria employed.

Updated estimates for each of the eight designated oil sands deposits, plus estimates for the Permian, Mississippian, and Devonian carbonate "oil sands" accumulations, are provided. Where surface mineable reserves are believed to exist the ERCB method is described and "surface mineability factor" maps are displayed, which show relative attractiveness of various areas for this exploitation method. A discussion is included regarding the grade and extent of oil sands deposits required to support in situ recovery schemes and recovery estimates are made for steam flooding. The effects of external constraints such as environmental requirements are discussed.

Where opportunities exist to compare the ERCB methods with those applied by various industrial estimators, this has been done.

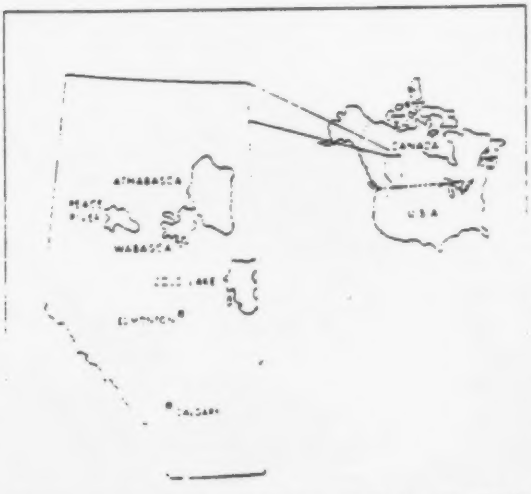


Figure 3a. Location and Extent of Major Oil Sands Deposits in Alberta, Canada.

1. INTRODUCTION

The Alberta Oil Sands Deposits have been delineated through the evaluation of data collected on some 8,000 drill holes. Those deposits occurring in sands of the Cretaceous Period are categorized according to the geographical area of occurrence and by geological unit, as follows:

Geographical Area	Formation Name
Athabasca	Wabiskaw-McMurray
Peace River	Bluesky-Gething
Cold Lake A	Grand Rapids
Cold Lake B	Clearwater
Cold Lake C	McMurray
Wabasca A	Grand Rapids
Wabasca B	Wabiskaw
Buffalo Head Hills	Bluesky-Gething

In addition, there are some large accumulations of crude bitumen in carbonates of the Devonian, Mississippian, and Permian Periods which underlie the Cretaceous accumulations in north central Alberta. In place reserves estimates have been prepared for each deposit on the basis of reservoir mapping, taking into account fluid saturations, porosity, and formation thickness. The Energy Resources Conservation Board (ERCB) until this date has recognized as proved recoverable reserves only those in the parts of the Athabasca area where deposits underlie less than 50 metres of overburden. However, in the opinion of the authors, gradual improvements in our understanding of the technology for *in situ* recovery of crude bitumen from the deeper deposits now enable us to estimate the potential recovery from them, admittedly with only a "first approximation" level of confidence in the accuracy of the estimates. In the case of the surface mineable deposits of oil sand, a summary of reserves criteria used by the Board, GCOS, and Syncrude, and proposed by Shell, Home, and Petrofina, as well as an economic evaluation entitled the "Break-Even Stripping Ratio", are reviewed. An evaluation of reserves using the present ERCB method entitled the "Surface Mineability Factor", is presented. The overall efficiency of surface mining projects is discussed.

With regard to reserves recoverable by *in situ* methods, a number of different methods are discussed and the authors have prepared a detailed evaluation of recoverable reserves by steam flooding. Each of the major Alberta deposits of oil sands has been evaluated using theoretical techniques which relate the heating value of the produced bitumen to the amount of energy that is required to produce it. This factor we have called the "Thermal Ratio", and maps are presented illustrating its value and thus the relative qual-

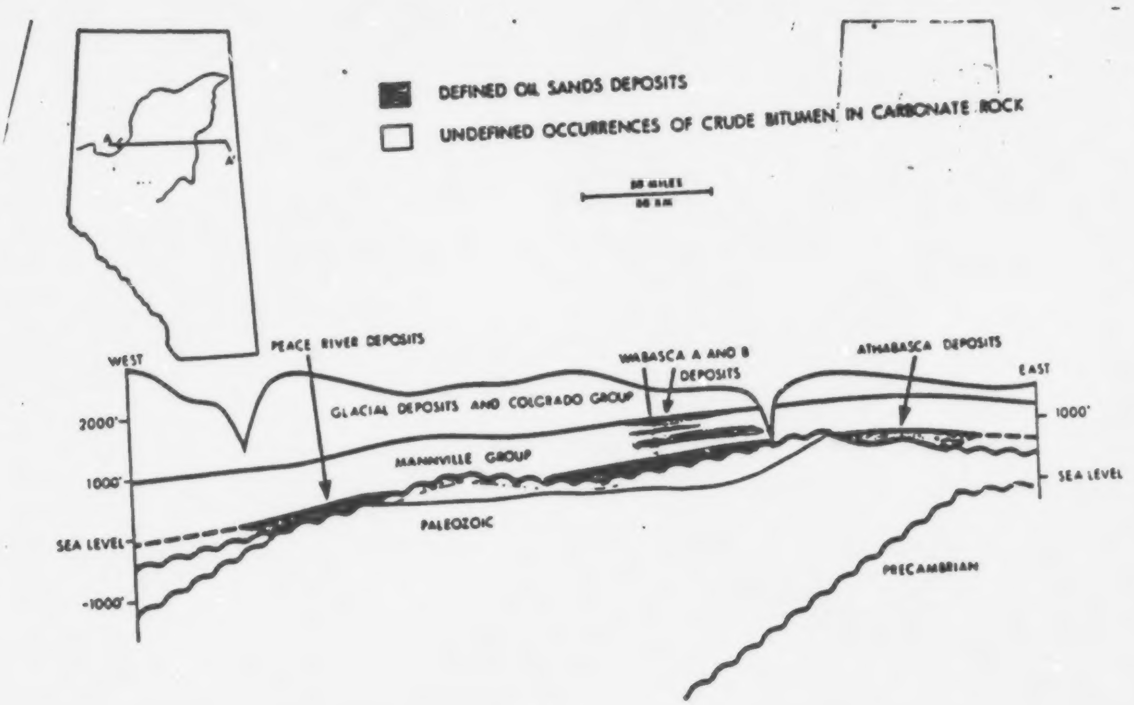


Figure 5b. Schematic Geological Cross-section Along A – A'.

ity of various areas within each deposit. The reserves which can be recovered as a function of the minimum acceptable "Thermal Ratio" have been calculated and a probable recoverable reserve is presented. The ERCB has not had sufficient time to review this evaluation and therefore does not now include these reserves in the proved recoverable category. In any case it looks forward to adopting it, or an alternative, in the future and may choose to await the commencement of a commercial *in situ* recovery project before recognizing such reserves as "proved recoverable". Therefore the reader is asked to bear in mind that responsibility for the material presented in this paper is entirely that of the authors, and not the ERCB or any other organization. A general review of the criteria employed by industry to define the potential for recovering crude bitumen from these oil sand deposits is presented.

The steam flood method was selected for estimation of recovery from the Cretaceous deposits not because the authors believe no other recovery method is feasible, but rather because more information is available on which to base the calculation of energy requirements, heat losses, and recovery efficiencies. For those portions of the Cretaceous deposits apparently not amenable to steam flooding, it has been assumed that other unspecified methods of recovery will be applicable. Lack of time and lack of technical development prevent any detailed evaluation, but a nominal estimation of recovery has been attributed to them.

In addition, there are some large accumulations of crude bitumen in carbonates of the Devonian, Mississippian, and Permian Periods which underlie the Cretaceous accumulations in north central Alberta. These accumulations have been very sparsely explored, but on the basis of the limited available data and some broad judgements, in place reserves estimates have been made.

Much extensive research and field experimentation remains to be done before definitive calculations of recovery are possible on the Paleozoic reserves, but we believe it is likely that some portion of this crude bitumen will ultimately be recovered. Without intending to convey any pessimism, we have chosen to make what we consider to be a very conservative estimate of the recovery factor.

Environmental constraints for surface mining operations, underground mining operations, and *in situ* operations are discussed. The authors expect that, with the anticipated development of a computerized oil sand data file, reserves determinations will be available with a minimum of delay and will employ criteria which will result in the best determination of reserves. It will be possible to draw comparisons of exploitation methods and to generate a development strategy for Alberta's oil sands.

2. DEFINITIONS

Part of the purpose of this paper is to provide clear statements as to what is being evaluated and what assumptions are involved so the reader may confidently compare this information with other deposits or other estimates. In order to accomplish this, definitions as used by the ERCB, together with some enlargements and explanations felt helpful by the authors, follow.

2.1 *Crude Bitumen*

Crude bitumen is defined as a naturally occurring viscous mixture mainly of hydrocarbons heavier than pentane that may contain sulphur compounds and that,

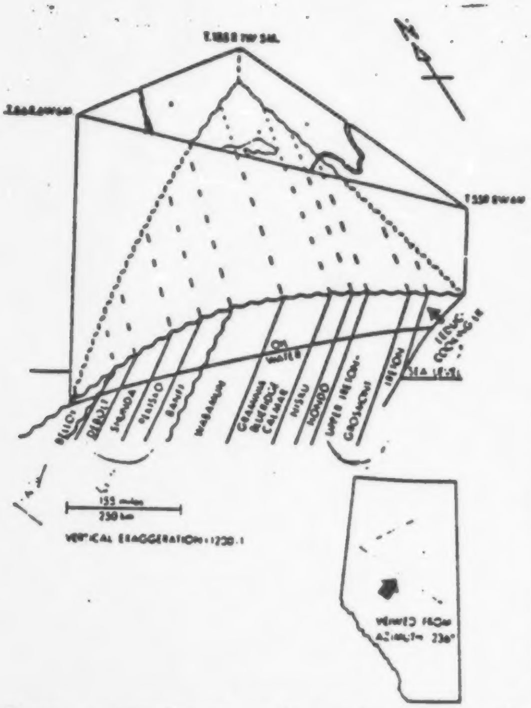


Figure 3c. Three Dimensional View of the Carbonate Oil Sands Deposit.

in its naturally occurring viscous state, is not recoverable at an economic rate through a well. Generally this material has a density of 986 kg/m³ (12° API) or heavier.

2.2 *Oil Sands*

Oil sands are sands and other rock materials which contain crude bitumen and other associated mineral substances. (This definition does not define the type of rock material and suggests that oil sands may be other than clastic sediments and can be loosely interpreted to include all rocks which contain crude bitumen. The huge volumes of carbonate reservoirs which contain crude bitumen can then be called oil "sands").

2.3 *In Place Reserves*

The in place reserves consist of the total resource in a deposit less any portion of it deemed unrecoverable by any foreseeable technology or under any foreseeable economic circumstances. Elimination of sands having a crude bitumen saturation below some minimum cut-off illustrates the concept.

3. IN PLACE RESERVES OF CRUDE BITUMEN

3.1 *Cretaceous Accumulations*

The sedimentary rocks of the Cretaceous Period are derived from clastic materials generated in the Canadian shield area lying east of Alberta and the rising highlands of the cordillera to the west. From these two widely separated source areas the sediments were transported into the Alberta Basin by fluvial (stream) processes where they were deposited in a variety of continental deltaic and marine environments.

A large portion of the heavy oil sand deposits of Alberta are contained within the Lower Cretaceous Mannville group which has been subdivided into McMurray, Clearwater, and Grand Rapids formations. The Peace River Deposits occur in sands equivalent to the McMurray which are referred to as the Bluesky and Gething formations. The map of Alberta, *Figure 3a* indicates the location of the major oil sand deposits. The relationship of these units and the location of the major oil sand deposits are shown in the generalized cross-section, *Figure 3b*, which extends from the western border of the Peace River Deposit to the eastern limit of the Athabasca Deposit, just south of Fort McMurray.

3.11 Peace River Area

This deposit is located in north-central Alberta as shown on *Figure 3a*. The crude bitumen reserves of the Peace River area occur in the Bluesky and Gething formations of Lower Cretaceous Period. These formations comprise a clastic sequence lying unconformably on subcropping strata of Jurassic, Permian, and Mississippian Periods. The sequence pinches out against Mississippian carbonates to the northeast with the Bluesky sediments onlapping those of the Gething Formation. Depth of burial ranges from 450 metres (1500 feet) to 800 metres (2600 feet).

Structurally, the deposit is simple, with the upper Bluesky contact dipping southwest at approximately 4 metres/kilometre (20 feet per mile). The reservoir sands are progressively less saturated with crude bitumen and more saturated with water downdip from the pinch-out edge.

The Bluesky formation consists of well sorted and generally well developed, fine to medium grained, glauconitic sands interpreted to be either a marine facies equivalent to uppermost foothills Gething beds, or a marine reworking of Gething sediments.

The Gething formation consists of poorly sorted, discontinuous sandstones interstratified with shales and siltstones. Minor coal and chert-pebble bands occur in the section. The formation is interpreted to have a westerly source and to have been deposited in an alluvial plain environment.

The massive sands of the main trends are loosely consolidated to unconsolidated with some porosities exceeding 30 percent and averaging 27 percent for clean, well sorted sections. Sands away from the main trends are discontinuous, shaly and show varying degrees of compaction. Porosity for these sands averages 23 percent. Crude bitumen saturations vary considerably, but may exceed 80 percent of pore volume for well saturated sections. The density of the crude bitumen is also quite variable with typical values being in the range of 1030 to 986 kg m³ (6° to 12° API).

3.12 Wabasca Area

The Wabasca A and B Deposits are located in northeast Alberta, as illustrated in Figure 3a.

The Mannville strata of the Wabasca area are underlain by Paleozoic strata of the Grosmont, Winterburn, Wabamun and Banff formations. Remnants of channels have been instrumental in isolating Paleozoic strata favourable for the accumulation of hydrocarbons.

The McMurray formation, an erratic and discontinuous distribution of sands and shales, resulted from a deposition that filled the erosional channels. Crude bitumen deposits within these sands are of minor importance.

The Clearwater formation constitutes a sequence of sands and shales which are approximately 120 metres (400 feet) thick. The lower-most glauconitic

✓ Forestry

Drilling costs soar in forest lands

By David Climenhaga
(Herald writer)

Energy companies are paying as much as 10 times what they once did to drill for oil or gas on land inside Alberta's massive new forest management agreement areas, says a spokesman for the Independent Petroleum Association of Canada.

Richard Hillary said Tuesday that Alberta regulations governing land use in the massive new FMA areas given timber companies have enabled the lumbermen to charge up to 10 times as much in compensation for trees cut by oil companies as the government used to demand for the trees.

That, in turn, has resulted in a 10-fold increase in some drilling costs, especially to the junior exploration companies that are usually in the forefront of activity, said Hillary, IPAC's general manager of crude oil and natural gas.

Even the cost of seismic exploration for oil or gas can almost double, he said, and the energy industry is not happy about it.

Eventually, he warned, the situation if unchanged could reduce exploration activity.

But while juniors may be bearing the brunt of the high fees charged by some timber companies with FMAs, larger companies are also very concerned about the situation, said Hans Maciej, vice-president of the Canadian Petroleum Association.

As a result, he said, representatives of the energy industry expect to hold meetings with provincial Energy Minister Rick Orman and Forests Minister LeRoy Fjordbotten in February "to come to a rational solution."

The issue was raised by provincial Liberal energy critic Sheldon Chumir, MLA for Calgary-Buffalo, who accused the province of neglecting the interests of the energy industry when it entered into the FMAs.

Chumir said Tuesday that he has received complaints from energy companies carrying on activities in the province's 172,000 square kilometres of FMA land that some timber companies are "levying unreasonable charges."

"All the leverage is on the side of the forestry company in the event of a dispute, since the short drilling season (three to four months) in many FMA areas forces the energy company into a quick settlement," he said.

Hillary agreed. Because of the short time available, he explained, "you're forced to come to some sort of compromise agreement even if it means compromising your interests."

When oilmen cut down trees to make way for drilling or exploration, they have no objection to paying fair compensation to the forestry companies licensed to manage and harvest that timber, he said.

The problem is mainly that wording of the FMAs "is so tight and comprehensive (that) they can walk away with charging what they want."

In addition, he said, the compensation schedule may not fairly set the value of low-quality species such as aspen.

As things stand, he complained, to get permission from the timbermen to enter FMA land, oil companies must agree to pay compensation for the timber, cut it and "haul it to their mill site and essentially give it to them."

So, while "we're prepared to pay that compensation," the oilmen object to in effect paying twice or more for the timber they destroy.

In the planned talks with the province, the energy companies hope to come up with a fairer schedule of timber compensation rates, Hillary said.

But the ultimate aim, said Maciej, will be "to come to a policy decision that allows for the efficient operation of both industries."

CHUMIR: Raised issue

CALGARY HERALD

JAN 31 1990

ESTIMATION OF AOX VOLATILIZATION RATES FROM ACTIVATED SLUDGE EFFLUENT TREATMENT SYSTEMS OF BLEACHED KRAFT PULP MILLS

by Mitch Bronaugh

ABSTRACT

For several years pollution concerns regarding bleached kraft pulp mills have focused on the discharge of chlorinated organic compounds resulting from the use of chlorine compounds as bleaching agents. Industry responses to the problem include the use of better digesters and oxygen delignification to reduce the liglin content of the pulp before it reaches the bleach plant, increased substitution of chlorine dioxide for molecular chlorine, and adoption of activated sludge effluent treatment systems capable of removing forty to forty-five percent of the AOX from the effluent. This paper concerns the AOX which disappears on its way through the effluent treatment system. By estimating the rates of volatilization from the various components of the activated sludge system, it can be shown that volatilization may be the dominant AOX removal mechanism in many cases.

BACKGROUND

Biological treatment of pulp mill effluent was originally undertaken to reduce its biological oxygen demand by microbial action, and for this it has been effective. Coincidentally the same systems are found to remove thirty percent or more of the AOX from the effluent. Although it was initially thought that the bulk of this reduction was due to microbial activity, recent studies of bleached kraft pulp mill activated sludge effluent treatment systems have found that only 1.5% to 3.5% of total AOX is found in the sludge (Frostell 1988: Skogman 1989). This shows the fraction of AOX associated with settleable particles due to sorbtion or metabolism is very low, and the great majority of removed AOX must be accounted for some other way. It is not difficult to find statements in the literature to the effect that most of the removed AOX must be dehalogenated by microbes in the aeration basin. Since firm evidence is lacking, these statements seem to be based on the assumption that the removal is caused by the microbes: in the absence of other possible microbial pathways, dehalogenation is presumed to be the explanation by process of elimination.

DISCUSSION

Another mechanism for AOX removal is volatilization from the effluent treatment system. That volatilization plays a role in AOX removal is a matter of general agreement, but it is often incorrectly assumed that its importance will be limited to a few chemical species, such as chloroform, which have relatively high vapour pressures. Published reports of field measurements of AOX volatilization from bleached kraft mill effluent treatment systems appear to be entirely lacking; until recently, even suitable procedures for measurement were not to be found in the literature (Esplin, 1989).

Volatilization of a non-polar organic solute from water is controlled not only by the vapour pressure of the substance in question, but also its molecular weight, solubility in water, and the nature of the air-water interface through which it must pass (Thomas, 1982). For estimation of environmental volatilizaation rates, the approach generally used is to consider the problem as a series of transfer regimes: first, turbulent movement of water maintains a more or less uniform solute concentration throughout the water body except near the surface where a thin stagnant layer exists in contact with the air. Second, individual molecules of the solute diffuse through the stagnant water film. Third, the solute moves through a stagnant air film in contact with the surface of the water, also by molecular diffusion. Fourth, the solute molecules emerge into the region of turbulent air mixing and transport. Since resistances in the second and third stages dominate, this is generally referred to as the two film model (Thomas, 1982).

Propensity of any non-polar organic substance to volatilize from water is largely determined by its Henry's law constant, H, which describes the equilibrium partitioning of the solute between the air and the water, much as the vapour pressure describes the equilibrium partitioning between the pure substance (solid or liquid) and the vapour phase in the air above it. For compounds with values of H lower than about 2 Pa m^3/mol, resistance of the air stagnant film dominates, as low concentration in the air means relatively few solute molecules can be diffusing through the stagnant air film at any one time. Suntio et al (1988) show that neutral AOX compounds generally have values of H between 100 and 1000 Pa m^3 /mol, and should therefor be regarded as highly susceptible to volatilization, since the air film diffusion resistance in this range is only about one tenth the liquid phase resistance (Thomas, 1982). Regarding non-neutral AOX species, Suntio et al state "The phenols and acids appear to have H values of 0.1 to 2, thus volatilization from water is not expected to be an important process, except under conditions of intense air-water contact, as occurs, for example during aeration processes." (Suntio et al, 1988). Aeration processes characterize activated sludge effluent treatment systems.

In the case of relatively fresh air moving over a heavily polluted water body (which describes the case with a pulp mill effluent treatment system), the flux, or rate of volatilization per unit area, is equal to some overall transfer rate KL times the concentration of solute in the water. Total resistance to water-air transfer is the sum of the resistance of the stagnant air film plus the resistance of the stagnant water film, and the overall transfer rate constant KL may be seen as the reciprocal of the overall resistance. and is analogous to depositional velocity. Thomas (1982) presents a table of values for KL and Henry's law constants for various organic compounds. Note that the KL value for chloroform is only about 50% higher than for Aroclor mixtures (PCB's). even though its vapour pressure is a million times higher. The KL values presented in this table are useful for comparison of relative rates of volatilization for various chemical species, though actual observed environmental volatilization rates tend to be lower in absolute terms.

Eisenreich (1987) refers to volatilization rates of about 0.24 m/d for PCB's and dichlorobenzene in various large cold lakes. This seems a good starting point for estimating KL values for the different conditions found in effluent treatment systems, by adjusting for temperature etc. Mackay and Yuen (1983) have developed equations expressing stagnant film resistances as a function of Schmidt numbers. Since the Schmidt number is the ratio of kinematic viscosity to molecular diffusivity, and since these two factors governing stagnant film thicknesses are influenced by temperature in known ways (molecular diffusivity approximately doubles for each 20C temperature increase, and viscosity can be looked up in a table), this approach facilitates adjustment of KL for different temperatures, and the predicted rise in volatilization rate is 2.8% per centigrade degree. (Mackay and Yuen, 1983).

It can be shown that $Ln(C/Co) = -KLt/Z$ (equivalent to Thomas's equation 15-11), where C is the concentration of the solute in the water at any time t, Co is the initial concentration, Z is the average depth of the water body, and KL is expressed in units compatible with t and Z. Once the value of KL has been adjusted for temperature, this equation facilitates estimation of volatilization losses for AOX species from various stages of an effluent treatment system for which depths, temperatures and hydraulic retention times are known. (Since any appreciable microbial degradation of AOX species can only occur in the aeration basin, or bioreactor, the equation could be modified to include some biological rate constant as cofactor with KL for estimation of AOX losses in the bioreactor component only.) An exceptional case involves cooling towers, spray cooling, and other processes involving droplets and/or bubbles. Because such systems achieve equilibrium very quickly, volatilization rates will depend on the Henry's law constant H rather than on the diffusion characteristics which dominate equations based on the two film model. For species in question, values of H increase by about an order of magnitude for 25C temperature rise. (Eisenreich, 1987). The fraction of AOX removed by volatilization during the effluent's transit of the entire activated sludge system can be calculated by obtaining the product of all the fractions retained through each component of the system (C/Co) and subtracting this product from unity.

FACTORS NOT INCLUDED

Some other factors will affect volatilization rates. Because these are difficult to quantify, they are not included in the calculation of estimates, but are discussed as part of the context of the calculations. Because of the probable importance of aeration and turbulence, omission of these factors from the calculation will probably result tin low (conservative) estimates of volatilization rates.

Molecular weight: Diffusivity depends on the sizes and shapes of solute molecules, varying approximately with the inverse square root of the molecular weight. Since the great majority of OX involves species with molecular weights between 100 and 2000 (Skogman, 1989), use of PCB's with molecular weight of about 300 as a standard may result in overestimation of AOX volatilization by around 30%, except in the case of cooling towers and other processes involving equilibrium conditions, which will not be materially affected by variations in diffusivity.

Sorbtion: Sorbtion onto particles (including colloids) greatly diminishes availability of molecules for volatilization. Highest sorbtion rates correspond to lowest temperatures, and the lowest effluent temperatures in an activated sludge effluent treatment system are found in the secondary clarifier. Since less than 7% of the AOX in the secondary clarifier is sorbed to settleable particles. it seems reasonable to expect that the effects of sorbtion will reduce AOX volatilization by less than 20% overall.

Thermal convection: Since effluent temperatures may range from 35C to 60C in different parts of an activated sludge effluent treatment system (much warmer than the ambient air), convection currents in both water and air may be expected to reduce appreciably the thicknesses and resistances of the stagnant films, increasing volatilization rates, especially in relatively quiescent regimes such as clarifiers.

Aeration and turbulence: The aeration and turbulence essential to any activated sludge system increases volatilization by disrupting the air and water stagnant films and by creating conditions of intense air-water contact. The effect of aeration and turbulence is particularly difficult to estimate but it is probably very large

~~CONCLUSION~~

CONCLUSION

A method for estimating AOX losses by volatilization from bleached kraft pulp mill activated sludge effluent treatment systems has been presented. Application to modern pulp mill proposals indicates volatilization may be the dominant mechanism of AOX removal from such systems. Improvements to the approach taken in this paper await publication of data from reliable field measurements. The importance of addressing the effects of volatilized AOX species on nearby humans and other organisms must be stressed.

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A BRIEF

PRESENTED TO

THE CLEAN AIR STRATEGY FOR ALBERTA

JANUARY 10, 1991

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BRIEF PRESENTED TO THE CLEAN AIR STRATEGY FOR ALBERTA

When we look at the ingredients that pollute our air such as CFC's, VOC's, nitrogen oxides, methane, sulphur oxides, ozone, and carbon dioxide the best solution to keeping our air clean is to eliminate these by-products by cleaning up the sources that produce them. This may seem expensive to the companies producing commodities and to the people purchasing them, but the expense down the road to the health of Canadians and the earth ecosystem will be much greater. It will be catastrophic probably; the time to be tough and carry out legislation to cut these emitted substances is now.

I have the following suggestions:

1. The energy industry must be legislated to comply with zero emissions.
2. The best available technology must be the only choice for these industries regardless of cost, because the cost to life down the road will be much greater.
3. Research into zero-emission technology must be a priority, with subsidization by government, or carried out by government with the eventual sale of this developed tenhnology to private companies.
4. Air pollutant diseases are on the rise, such as asthma and will get progressively worse if air quality is not maintained and improved.
5. Alberta, a major producer of gaseous energy-related emissions, must make an immediate political committment to educate people about the problems of emissions into the air and seek their cooperation in conservation and efficient use of all energy consuming products.
    a. information on energy efficient appliances, reduction of electrical gadget use should be available everywhere from supermarkets to book stores to bus shelters.

6. Individuals must be made to see that they play a role in the greenhouse effect and acid rain as well as industry.

7. California auto-emission standards should come into effect immediately on all new vehicles sold in Alberta.

8. Financial incentives should be forthcoming to cities from the provincial government to promote use of mass transit.

9. Penalties in the way of a fuel tax, tire tax should be administered on all vehicles used for commuting to and from work by office workers on major public transportation routes. This might be an administrative challenge but couldn't be worse than the GST administration mess.

10. Alberta should be lobbying the Federal government to increase rail service for people and goods and discourage truck transport of goods and individual use of motor vehicles by the travelling public. Bus service for goods and people should also be encouraged and improved.

11. Increased price means decreased use and conservation: therefore, all energy consuming products should be subject to a "green tax" at the time of purchase. However, all this money should be used to finance research, conservation and education in energy efficient procedures and devices and technology.

12. People, industry and government must change their way of life. People must be willing to have less gadgetry and carry out non-consumptive lifestyles. Industry must be willing to install and pay for the best technology available towards the zero-emission goal and more efficient use of energy. Government must be tough in its legislation to see that individuals and industries comply and work towards these goals. Government must regulate itself stringently in the matter of energy conservation and zero-emission goals.

13. Industry and the governments who regulate them must change their attitudes. Right now, industry operates under the policy that they will only comply with the minimum pollution requirements and they fight these tooth and nail. Of course, the reason is money--it costs more to put on the maximum pollution requirements and cuts into their profits. What good are profits if there is no clean air left to breathe? Government can no longer be lax in these matters--best emission control technology must be required. One clear example of this attitude in the area where I live is the OSLO upgrader facility scheduled to be built near Redwater. They are required to remove 98% of the sulphur dioxide emissions by government regulations and so are complying. This seems great but the plant is so big they will still discharge 20 tons of sulphur dioxide (acid deposition and rain) on the land, plants, animals and people every day. For 15 to 20 million dollars (total cost of the plant is 2 billion dollars) extra, emissions could be reduced to zero. This company is not willing to put maximum pollution controls on for another 4% added to the cost of the project. They have stated that costs to reduce emissions is prohibitive; they also stated that if emissions must be reduced to zero for environmental reasons they will take the necessary action. In other words, if they are forced into putting on the maximum pollution requirements they will but they won't do it as a good corporate citizen to protect people's health and livelihood. Therefore, government must regulate these maximum pollution requirements in all cases.

Barbara Collier

A PROPOSAL TO COMBAT GLOBAL WARMING

Third Edition

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April 30, 1990

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Revised: April 30, 1990

A PROPOSAL TO COMBAT GLOBAL WARMING

EXECUTIVE SUMMARY

This report has two basic parts, the first of which supplies sufficient background information on the causes of global warming to enable the reader to acquire a perspective view. The second part advocates a method of attacking the root of the global warming problem, using an automatic negative-feedback pricing system in a global market with strong capitalistic overtones, and based on direct responsibility.

State of the Earth:

A general description of the planet, as it relates to global warming, is outlined, with details of the major carbon deposits and their traditional roles and cycles in establishing atmospheric gas levels. Environmental damage resulting from a burgeoning civilization is examined, as well as the theory of various cycles and effects. The progression toward two basic conditions is undeniable; a decline in the traditional natural systems which isolate carbon from the atmosphere, is being aggravated by an excess of anthropogenic carbon dioxide emissions.

A few realizations about a rising population determine that both basic conditions must be improved for any possible resumption of stable, familiar gas levels. Even once fossil fuels have been abandoned, atmospheric restorative systems will still have to be maintained.

The Great Social Challenge to Achieve World Consensus:

Extrapolations of present trends are used to view possible future developments, with descriptions of popular and not so well known phenomena. Some scientific views of an uncertain future are briefly explored for both information, and to lend these views credence.

Probable delays to acquiring a mandate are examined, concluding that amongst various nations, material change will not occur without legislation to maintain fairness. The legislation needed is simple and would likely involve the implementation of a carbon tax for most peoples.

Abundant Vegetation Needed for Atmospheric Carbon Removal:

A closer look at forests, some of the many roles they play, and some of the effects of deforestation is provided, including the effects of cattle grazing. Possible future roles of forests are discussed.

Waste Air Management, as an Industry, Must be Established:

Just as solid and liquid waste management are being incorporated into all affairs, so must waste gas management. Payment for atmospheric carbon dioxide removal must be sufficient on a continual basis to ensure preservation of the world's vegetation. Although some nations have expressed willingness to offer financial support, it is necessary for all carbon users to participate for satisfactory results.

Creating a Market for the Waste Air Management Industry:

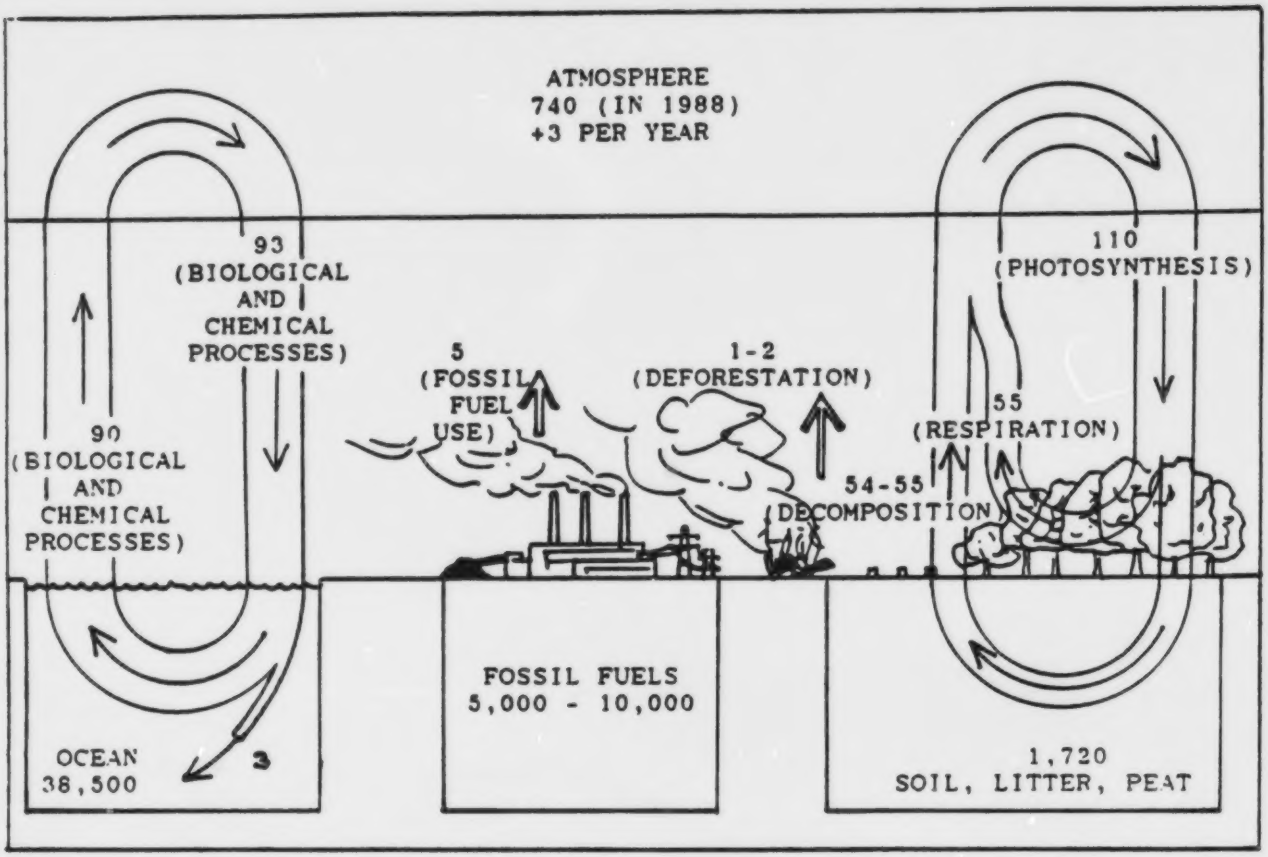
All nations should be assessed for their role in carbon usage, and should be penalized or rewarded accordingly. A world-wide agreement is needed to ensure that the penalties will always be sufficient to pay for scheduled atmospheric restoration. Penalties are to be extracted, based on each nation's carbon emissions, and paid to tree-growing nations according to the carbon that is removed from the atmosphere, at the same rate. This rate, price per unit measure of carbon dioxide, will fluctuate according to demand; the more drastic the need for atmospheric modification, the higher the going price. This will establish a negative feedback system, the surest way to apply constant restorative pressure, controlled by direct responsibility. The only intervention from normal market practices, is the application of desirable atmospheric change quotas, to be established by an international group of economic, political, and environmental scientists, which will in turn, influence demand and price. The objective is to balance atmospheric carbon removal against carbon emissions, in order to achieve a desired level.

A heavy carbon tax, the logical result of an industrial nation seeking to fund its national emission fee, would stimulate fuel replacement with more sustainable energy sources. The two basic differences between this proposal and those being circulated throughout the media, are that: the fee is automatically raised and lowered according to the planet's ability to cope with emissions, and all of the payments are to go directly into financing atmospheric restoration - forest production. Again, the amount of financing made available for forest production will depend on the shortfall, or demand. The market, by virtue of this feedback action, will be self regulating.

Additional Wide Benefits to Consider:

Many benefits can be realized with the use of sustainable fuels and the increased presence of forests, such as the prevention of soil runoff, an almost complete reduction of most air pollution emissions, the preservation of biodiversity, and the expected improvement to rainfall patterns. The benefits are great enough that the morass of current anticipated national and international antipollution regulation and litigation, much of it muddled, arbitrary, and singular in effect, need not be employed.

A further benefit of enormous proportions will result from the reversal of the flow of wealth between the rich industrial nations, and their poorer neighbors to the south. One of the world's richest industries, waste air management through dense forestation, will become largely their commodity to sell.


ATMOSPHERE
740 (IN 1988)
+3 PER YEAR
93
(BIOLOGICAL AND CHEMICAL PROCESSES)
90
(BIOLOGICAL AND CHEMICAL PROCESSES)
5
(FOSSIL FUEL USE)
1-2
(DEFORESTATION)
110
(PHOTOSYNTHESIS)
55
(RESPIRATION)
54-55
(DECOMPOSITION)
OCEAN
38,500
3
FOSSIL FUELS
5,000 - 10,000
1,720
SOIL, LITTER, PEAT

"Carbon is exchanged between the atmosphere and reservoirs on the earth. The numbers give the approximate annual fluxes of carbon (in the form of carbon dioxide) and the approximate amount stored in each reservoir in billions of metric tons. The existing cycles - one on land and the other in the oceans - remove about as much carbon from the atmosphere as they add, but human activity (deforestation and fossil-fuel burning) is currently increasing atmospheric carbon by some three billion metric tons yearly. The numbers are based on work by Bert Bolin of the University of Stockholm."

Scientific American September 1989

A PROPOSAL TO COMBAT GLOBAL WARMING

I. INTRODUCTION:

This report was assembled on a private initiative, following the intense media coverage on the environmental degradation, throughout the year, 1989.

Purpose and Scope:

The purpose of the report was to explore and publicize an ideological concept, with the aim of stimulating meaningful action against global warming. Much difficulty in achieving a consensus of public realization, motivation, and commitment is expected. The informational part of the report is designed to educate, alarm, and then relieve the reader with a description of a possible solution and course of action.

Background:

"Global Warming" describes a worldwide condition which will become an increasing concern for some decades to come. It is the result of a physical phenomenon, popularly called the "Greenhouse Effect", an expression already cliched in "fashionable" conversation, which describes the increasing insulating properties of the atmosphere, caused by a change in the proportions of its gaseous components.

Solutions for global problems of this magnitude, require that all the world's nations unite their efforts towards the common goal. Fears of the inability of such numerous and disparate societies to unite, are presently very high; "Lack of political will", is the popular phrase. A logical, fair, sensible, and sensitive plan could contribute much to alleviating this fear, and sustaining a vision, direction, and hope.

Sources:

The information provided is so general as to be almost common knowledge amongst environmentalists and earth scientists. There are no new facts or theories employed in his report. Important figures which describe the scope of the problem, are referenced, mostly to the special environment issue of *Scientific American* from September of 1989.

Limitations:

This report was designed to convey an idea. The figures used are nominal only, often hypothetical, and are not intended for use in actual calculations.

II. A GENERAL VIEW OF THE PLANET, EARTH:

The major constituents of the atmosphere, nitrogen and oxygen, allow much of the heat of the sun's energy that strikes our planet to escape back out to space at a rate which keeps the Earth's average temperature at a fairly constant level. However, some of the lesser gases, known as trace gases, tend more to trap the heat, much as the glass does for a greenhouse in colder climes. It is the increase of these more insulating trace gases, primarily carbon dioxide, which is the subject of our attention.

Carbon is an element so inextricably linked to life on earth that it can be observed that: where there is carbon, there is or has been life, and where there is life, there is carbon. Besides existing in the cellular structure of every living organism, there is an estimated total of 51,000 Billion Tonnes of planetary carbon distributed throughout the land, air, and waters[1], which is involved in the biological carbon cycle.

The largest deposit by far lies within the oceans with 80% of the total planetary carbon, amounting to 38,500 Billion Tonnes.[1] A significant portion of this deposit is involved in a vast ecosystem which shares an annual exchange of 93 Billion Tonnes with the atmosphere. Three Billion of these Tonnes are captured as mineral, plant, and animal deposits which contribute to the ocean floor, and to structures like the island of Barbados. A major part of the organically involved carbon is contained in the structures of phytoplankton; a tiny photosynthesis activated lifeform, which is the basis of the oceanic food chain. Other significant fractions exist in the form of calcium carbonate in the shells of all crustaceans, mollusks, and in the skeletal structures of coral, as well as in solution in water. In fact, carbon dioxide being easily dissolved in water, is present in solution in a much higher proportion to other dissolved gases, than its normal .03% or .04% (1/25 or 1/30 of 1%) of the atmosphere.

Should these figures of planetary carbon seem low, that is because they include only that carbon which is involved in the biological carbon cycle; an integral part of Earth's biosphere. Far greater quantities of carbon exists as chemical constituents of sedimentary rock. A larger carbon cycle, known as the geochemical carbon cycle, serves as a long term control that distributes carbon near the surface of the earth, and shares portions of the biological cycles. This larger, slower cycle involves the weathering of rocks by water made acid with subsurface carbon dioxide released from rotting organic deposits, The runoff with the dissolved carbonate and silicate compounds eventually reaches the oceans. In the oceans, the calcium carbonate is used to make shells and bones of marine organisms, which are deposited on the ocean floor after the death of the organism. If the floor becomes buried with tectonic movements and subjected to high enough pressures and temperatures, the carbon will be released to atmosphere via volcanoes and soda springs.

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[1] Stephen H. Schneider. "The Changing Climate," *Scientific American*. (September 1989), 70.

In perspective then, the carbon traces branches of this path: weathered from rock exposed to acidic water, in solution runs off to ocean, in ocean it is incorporated into organisms to be later deposited on ocean floor, eventually to be buried under tectonic movement. If the carbon is later released to atmosphere under pressure and high temperature, it will be used by vegetation and enter the terrestrial biological cycle. The carbon in the decomposing detritus left from vegetation forms carbonic acid with water and joins the rock weathering process to be runoff to the oceans.

It is this weathering process which has brought carbon dioxide levels down from being a major atmospheric constituent, to status of trace gas. Only the emissions from springs and eruptions prevent all the carbon from being incorporated into the earth's crust, leaving enough to sustain life. There can be no hope however, that this very slow geochemical process will play a role in reducing our current greenhouse effect. Whereas gas level changes to the atmosphere due to biological cycles are measured in tens of thousands of years, the effects of geochemical carbon cycles are measured in terms of millions of years.

The next largest carbon deposit, and the most compact, is contained in the underground gas, coal, and oil formations resulting from the fossilization of buried organic material from bygone ages. Estimates of the total fossilized carbon deposits range from the equivalent of 5,000 to 10,000 Billion Tonnes of carbon dioxide which is 10% to 20% of the total planetary carbon. Since much of the heat derived from burning fossil fuels results from the chemical action of the carbon in the fuel combining with atmospheric oxygen, the very concentrated content of carbon in these fuels have made fossil fuels the main tool of industrialization.

The next carbon pool to examine exists just above and below the earth's surface, in the form of vegetation and dead vegetable remains in various states of decomposition, such as humus. This deposit constitutes a mere 3% or 4% of the total planetary carbon, amounting to 1,720 Billion Tonnes.[1] All of these estimates are at this stage only rough. This deposit also shares a cycle of carbon exchange with the atmosphere, involving 110 Billion Tonnes of carbon dioxide due to the respiration and decomposition of plants and plant matter.

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[1] Stephen H. Schneider. "The Changing Climate," *Scientific American.* (September 1989), 70.

The last remaining carbon reservoir to consider is the atmosphere itself. In 1988, this was estimated to contain 740 Billion Tonnes of carbon dioxide, or 350 parts per million.[1] Its presence in only trace amounts in the atmosphere, allows a significant proportional change with the addition or removal of just a few Billion Tonnes of carbon dioxide.

Historically, atmospheric gas levels were maintained by natural processes involving growth and decomposition of vegetation, climatic cycles and ages influenced by orbital eccentricities, geological and cataclysmic events, and many other factors and relationships which have not yet been fully understood. It is unclear which is more cause and more effect, but records have shown that there is a direct relationship between Earth's temperature and the atmospheric levels of CO_2. The rate of rise and fall of carbon levels in the air has always parallelled the fluctuations of temperature during the last couple of hundred thousand years. Although these fluctuations have been large, the time spans involved are measured in thousands of years.

III. SPECIFIC ENVIRONMENTAL DAMAGE IDENTIFIED:

A more abrupt change in gas levels can be traced to shortly after the beginning of industrial mechanization, and with the spread of civilization across all habitable continents. The rise in trace gases was relatively gentle until the pace of industrial expansion, and the exploding population characteristic of post war conditions, have forced the climatic issue to prominence.

In general, atmospheric gas level balance is maintained and affected by the influence of a variety of positive and negative reinforcing elements. As a system overbalances in one direction or the other, a positive reinforcement will add to the trend and increase the change further, while a negative reinforcement will act against the direction of movement, as a stabilizer. It is largely the action of these reinforcing effects which will determine the state of the atmosphere.

Not so long ago, say 50 or even just 20 years ago, the planet did have a better capacity to reabsorb the carbon that civilization had liberated in the form of carbon dioxide. However, in the past few years, the recovery systems that did serve to maintain normal atmospheric gas levels, have been removed or so decimated as to be rendered largely impotent or nonexistent. Dwindling tropical forests and coral reefs are examples of the degradation of restorative systems. The problem is twofold: while polluting emissions have increased dramatically, the balancing counter forces have been hugely destroyed. The balance of positive to negative reinforcing elements has been altered severely in such a way as to accumulate greenhouse gases.

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[1] Stephen H. Schneider. "The Changing Climate," *Scientific American.* (September 1989), 70.

Assessing the state of the oceans and their exact role in the distribution of the world's carbon supply is difficult and remains largely unexplored. Meaningful conclusions have been simple, sketchy, and speculative. Considering oceans only as physical bodies of water, exclusive of life and its processes, will likely find them to be very stable reservoirs of carbon dioxide merely due to the immense mass involved. However, because of the vast complexities of currents and varying mixing rates, most of which remain uncharted, it is impossible to judge the role of the oceans with any realistic confidence.

Some prime arguments center around the oceans' ability to dissolve carbon dioxide as the temperature and gas levels rise. Higher concentrations of atmospheric CO_2 will tend to force more gas to dissolve in the water. But, this may well be balanced or even overcome by the reluctance of heated water to accept dissolved gases. It would seem that any water close enough to the surface to dissolve more carbon dioxide, will likewise be warmed by the higher temperatures.

As an ecosystem, the oceans have been very effective in helping to keep atmospheric carbon levels lower. Invigorated life processes serve to involve much carbon dioxide which would otherwise be released to the atmosphere and which also fix, in a more permanent fashion, a further 3 Billion Tonnes of carbon dioxide in the form of sediments and deposits.
In the absence of suitable currents, the lowest oceanic levels received carbon dioxide from the bacterial action on dead organic tissue which has drifted down from the surface layers. This action of bringing surface carbon down to the lower water levels is sometimes referred to as a "biological pump", and allows greater volumes of the oceans to act as a carbon "sink". As such, the oceans have been an everconsuming absorber of carbon. However, these life processes, and the carbon they trap, are entirely dependent on the health of the oceans. Reduce the life processes, and less carbon from decomposing tissues will be deposited on the ocean floor, or biologically transported to the lower marine levels.

Lately, the oceans as an ecosystem, have been suffering. Coral reefs are on the decline. Since coral quite happily grows upon itself, theoretically the reefs could have been if allowed to, constantly expanding, constantly pulling carbon from the sea and adding to the deposit, not merely maintaining a balanced cycle. But, most of the world's reefs have been severely wounded, some mortally so. They have been choked on the effluent of human activity, dredged for harbours and boatways, sealed off by bridges and causeways, buried under the silt of erosion run-off from deforestation which is often laced with agricultural chemicals, poisoned and blown to bits by tropical fish collectors, broken and picked apart by souvenir hunters, and made to suffer many other assaults not mentioned here. As it is, reefs are less and less adding to themselves and supporting other carbon based lifeforms.

As net consumers of carbon dioxide, the oceans are quickly fading. Although their great physical mass and the resulting stability will not be easily affected, at their fringes, near where the water meets the land and the depth is shallow, where there used to be thriving "forests" of coral, the crumbling remains are now slowly dissolving.

As long as the oceans remain as a major medium for transportation, and as a dumping ground for unwanted substances, many of which are toxic or diseased, and the dumping remains impossible to police, it is difficult to imagine marine life increasing from the present.

The terrestrial pool of carbon, consisting of plants and plant matter, is more familiar to us, and its character can be verified in all our surroundings. Carbon is an essential element in every cell of anything that ever grew out of the ground. An amount of carbon equal to about 7% of this pool, is exchanged annually with the atmosphere through living respiration processes and the decomposition of dead matter. This terrestrial pool contains more than twice the carbon contained in the atmosphere.

Since the onset of civilization and its land clearing practices, the terrestrial carbon pool has been continuously shrinking. The shrinkage was relatively inconsequential until about the time of the Reformation in the 1500's. Discoveries, both geographical and scientific, lead to colonization and the expansion of land settlement, and started the population rise on an ever increasing spiral. Any carbon that is removed from this pool is eventually released to atmosphere, quickly as the product of burning, or more slowly as the product of decay. Removal of living matter from the soil not only subtracts directly from the terrestrial pool, but also reduces some of the ability to involve a portion of the atmospheric carbon in a life cycle.

The rate of reduction in vegetable deposits varies according to the degree and method of deforestation. Any burning results in the immediate release of carbon dioxide as a byproduct. If a forest is cut, the lumber won't release its carbon until it decomposes, which could take centuries, depending on the disposition of the wood. The application to which the newly deforested land is devoted will determine the rate of decomposition and the resulting release of carbon dioxide of the remaining detritus, humus, or other surface or subsurface organic deposits. If a new forest begins growing immediately, there will be little release from the subsurface remains since these remains will serve to fertilize the new forest and its respiration cycle.

The worst case scenario, or highest destruction rate, can be witnessed with the current deforestation of the Amazon region. The forests are burned as completely as possible to clear the land. This stops the chemical exchange between the subsurface nutrients and the trees above. Then the tree roots are pulled, or allowed to decompose, exposing the soil to devastating erosion. The soil, no longer being supplied the detritus from the thriving, dense jungle which has been cleared, loses its nutrients. The growing of crops hastens the depletion because a harvested crop leaves little behind, and nothing is returned to the soil. The soil quickly becomes sterile and unable to produce a crop; none is grown there again, and the erosion intensifies in the heavy rains. To the rest of the world, it means that all of the carbon , which is a substantial amount in a tropical forest, previously locked into the above ground and subsurface material associated with the cleared forest, has been released into the atmosphere ... and gone is the ability to grow new vegetation which would trap and retain additional atmospheric carbon dioxide.

Much of the world's forests have been razed to accommodate man and his single minded ambitions of short term, self gratification. It is only in the last few years however, that serious deforestation attacks have been made on the tropical rain forests; the "lungs of our planet", to use one of David Suzuki's expressions. It is amusing to carry that metaphor further, likening the atmosphere to blood - the transporter of oxygen and carbon dioxide, the sun's heat and thermal expansion to the pumping action of the heart, etc.. This metaphor quickly illustrates how the failure of one component will eventually lead to the collapse of the whole system.

IV. COMBINED EFFECTS OF ENVIRONMENTAL DAMAGE:

The destruction of many of the world's carbon consuming systems, and the increase of carbon emissions from human activity are combining so that the rate of rise of insulating gases in the atmosphere is climbing at an unprecedented level, hundreds of times faster than exists in all geological records. The current carbon dioxide production rate is now twice the world's carbon fixing ability[1,2], and is rising every day.

That this rise in greenhouse gases is a problem, because the increased insulation will effect a rise in global temperatures, is indisputable. What is often argued is the extent of the temperature rise; how fast the rise, and at what point will the temperature stabilize. The feedback systems, such as the oceans in all their immensity, all function at different time scales, and temperature stabilization may not occur for many decades even if the great carbon cycle can become balanced. The out-of-phase feedback systems will in turn tend to destabilize the balanced carbon cycle keeping all the gas and temperature levels in flux for more prolonged periods yet. During this time, analyses of these conditions will be uncertain, making the decision of which directions to follow very difficult to determine. As earthly inhabitants, and subjects of this strange and accelerating experiment on our planet, it would behoove us to moderate the pace of events before an irrevocable but intolerable situation develops.

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[1] Stephen H. Schneider. "The Changing Climate," *Scientific American.* (September 1989), 70.

[2] Minister of the Environment Canada. "The Greenhouse Gases," *Atmospheric Environment Service Fact Sheet.* (1986)

V. BASIC PROBLEM AND SOLUTION, SIMPLY STATED:

To recapitulate then: global warming, being the direct result of an accumulation of greenhouse gases in the atmosphere, can only be prevented by reversing the tendency to accumulate these gases, of which the principal component is carbon dioxide. This reversal can be achieved by reducing the carbon dioxide production, emission, or release to atmosphere, and by increasing the planet's capacity to fix, or entrap and lock, carbon dioxide away from the atmosphere. In accomplishing these goals, most of the other greenhouse gases will also be reduced since their production is often linked to the production of carbon dioxide.

Due to the magnitude of the problem, which can be shown with calculations using the figures and values quoted throughout this text, in order to reverse the carbon gas exchange, the attack to be successful, will have to be made from both fronts. Because of the limited size of the planet, attempts to rebalance gas levels by resolving only one of the two aspects of the problem will never suffice.

Even if all emissions from fossil fuels were to suddenly, if magically, cease, there would still be substantial sources of carbon dioxide. Beside all the traditional natural sources, such as volcanos, lightening-caused forest fires, etc., just the respiration of 5 to 10 billion people alone (a 150 lb, or 68 Kilo, man breathes out nearly 400 Kg of CO_2 a year) produces a considerable amount of atmospheric carbon, and this with no mention of the products of livestock. In fact, livestock have a problem all their own - cud chewing animals spew copious amounts of methane out of both ends as a digestion byproduct. Methane is a much more effective insulator than carbon dioxide but because of its smaller amounts, it is rated as the second or third most important greenhouse gas. (cfc's may be rated as second by some scientists)

Since so much of the atmospheric restorative mechanisms have disappeared (forests and aquatic life), the planet cannot possibly cope with any artificial carbon dioxide production at all. The move to a sustainable fuel is absolutely essential, necessitating the abandonment of fossil fuels. At this point, the ernest desire to save the planet, in many people will be seen to weaken and wane.

VI. A CONFUSED PUBLIC LACKING DIRECTION:

Years ago, in the early 1970's, much of the world contemplated a move away from fossil fuels but, at the time it was due to a fear of dwindling fuel reserves. It is a little ironic that when sustainable fuels are finally accepted, it will be because of intolerable emissions.

There is no way to avoid the fact that pollution controls will incur additional short term costs. The cause of pollution reduction is a rather abstract concept to be readily accepted by investors who are totally immersed in the world of finance and business, and very used to conducting their affairs, unimpeded and even encouraged, in the way they see best; their only accustomed intent being to maximize immediate profits.

The tendency for business and investors has been to procrastinate. The danger is that this tendency will continue past a critical point; that the decline in the environment will be irreversible and will become progressive, and that if the health of the biosphere doesn't enter a terminal spiral, it will be at best, forever crippled. The thought of all Earth's inhabitants having to expend most of their lives' efforts merely coping with a severe environmental condition, constantly on the brink of further deterioration, is a dismal prospect. Environmental scientists, who are "most in the know", have a frustrating time sounding the alarm. They lose credibility every time their cries of "Ten years left!" are drowned out by accusations that they've been saying the same thing for decades. But, these scientists are not doom-sayers forecasting an explosive end of the world ... they are looking for that point of no return. Discovering that point is not just difficult; it might well be impossible - except in retrospect.

To some degree, the lack of cooperation can be traced to a lack of education. Many of the general public - the voters, and even the "movers", not being particularly trained in the sciences, still believe that astrology and astronomy share equal relevance. Understanding how Earth can be suffering the effects of global warming at the same time that the present orbital cycles indicate the approach of an ice age, will surpass their comprehension. Even if or when the resistance to accept warming theories is overcome, education will still be hampered because the field of environmental protection is so new. Not only is the field new, but unprecedented conditions are always being encountered, the solutions for which have to be extrapolated from uncertain interpretations of a past experience not yet fully realized. It is as confusing as it sounds.

VII. POSSIBLE DEVELOPMENTS IF SITUATION NOT RELIEVED:

Acceptance of global warming theories will not automatically lead to agreement to prevent that warming. Opponents to the need to change will be those industrialists who are most dependent on carbon based fuel, especially those involved with fuel production. Undoubtedly, many theories on the resulting effects from global warming will abound and all ranges of opinion, from "doom and gloom"' to "Hey, things won't be so bad for us ... we might even benefit from a warmer climate" will be proffered, and everything in between.

For every argument denying the warming theory and its expected damage, there will be arguments to support the theory. Hazard proponents will argue that the disruption to rainfall and crop growing patterns will be too extreme to benefit anyone. But, all those arguments will pale in the face of the possibility of runaway warming fueled by several of the positive reinforcing elements, not to mention the continued carbon dioxide and methane production from natural processes.

Of the myriad of reactions to global warming, such as the much-discussed expected rise in sea level, some of the positive feedback systems could compound the warming and accelerate the process quickly. Imagine for instance, a shrinking arctic and the effect on sea levels. One effect would be that the receding snow would reduce the surface albedo (reflective ability) so that more sunlight would be converted to heat to be trapped in our greenhouse. A larger effect however, would result from the melting of the tundra as the permafrost receded. Melted tundra is not unlike bog or marsh, and the decomposition or rotting of which would release vast quantities of methane and carbon dioxide to the atmosphere. If this effect becomes sufficiently pronounced, the process resembles that of an exothermic chemical reaction whereby a chemical change produces heat, and that heat accelerates the chemical change. If the heat is insulated from dispersion, the reactions, one feeding the other, can turn runaway. These kind of hazards are unfathomable in our atmosphere as yet, and must never be toyed with ... a sort of Pandora's Box.

A new school of thought considers global warming to be a necessary precursor to ice ages. As air temperatures rise, so does humidity content. Water vapour has greenhouse properties of its own and a positive feedback system is initiated. Depending on the current state of vegetation on temperate land masses, water runoff may be high and land areas may become parched, as is happening throughout most continents now. As weather patterns shift, much of the cloud cover centers around polar regions producing two primary effects: the albedo effect (reflecting property) is increased so that the sun's rays are prevented from heating the ground, and snow from the clouds begins to pile; a sort of rebound effect has occurred and an ice age is entered.

Normally, it is argued, this cycle is lengthy, relying on thousands of years of leaching of nutrient minerals from the soil through plant growth and other natural processes. Finally, the products of vegetation become too sparse to sponge moisture, the runoff dries the land quickly, water tables fall, and cloud patterns shift poleward where the snow is dumped and the sunlight is reflected away by both cloud and snow. It is expected that only a slight rise in trace gases and their greenhouse effect is needed. The resulting increase in air temperature would permit higher humidity levels, and the greenhouse effect from the additional water vapour would not only push the temperatures higher, but would provide the cloud cover and precipitation over the poles. One of the early indications that would accompany the poleward drift of cloud cover and precipitation, and the growing desertification left behind, is an increase in the violence of storms due to the more extreme air temperatures caused by the concentrations of heat and cold from the pattern change. In the last few years, the planet has been experiencing record setting weather and an increasing number of storms of unusual severity. Some scientists say that this is the signal....

Convoluted and paradoxical as this theory seems, it may fit itself easily to the recorded glacial cycles of the past, and it seems to be gaining acceptance. The curious rebound effect and the reasons for it, seem to explain some of the anomalies between previous theoretical expectations and the development of actual recordings. Proponents of this theory are not perturbed by actual temperature rises being lower than expected. They say that only a little is required to initiate the water vapour feedback system, which will provide the energy to raise the clouds.

School followers claim that water vapour was the missing ingredient in previous globular study models, and that this correction better explains the empirical data now emerging. Their source of worry is a conglomeration of intertwined factors, a few of which are: demineralization of the soil allowing for only sparse and fragile vegetation which eventually succumb to hot and dry fires, desertification of temperate land masses, greenhouse effect from the burning of the vegetation, depletion of the ozone layer hastening the demise of the "planetary thicket", shifting growth and cloud patterns, and the concentrating of hot and cold areas. They also watch for intensifying and shifting jet streams around which will rage more frequent and violent storms and tornados, where there were few or none before. Their hope is to stop the greenhouse effect before the positive reinforcement of the water vapour really kicks in. By this time, the growing conditions will have been completely disrupted, threatening food and forest production. They know not at what speed all this is to occur. Historical data is no example because, as discussed earlier, conditions are way beyond precedent, and show no signs of moderating. Even presented in this very simplified form, it is indicative of the incredibly complex material relationships that can be involved on the surface of so large an object and its feedback systems, as the planet Earth.

VIII. PUBLIC CONVICTION, ALTHOUGH NECESSARY, IS NOT EASILY ACHIEVED:

Many scientists and environmentalists find themselves in the awkward position of hoping (rather silently, of course) for the occurrence of a minor calamity to bring the point home to everyone, that the time to act, regardless of the monetary costs, is now; and better to hope that it is not too late. The major driving force for this change is no longer to be directed only by the whims of economic opportunists. That is not to say that there will not be many economic opportunities created, or made available, by this shift away from fossil fuels, and many of the details will be handled by economic opportunists. The intent of this proposed change is not necessarily to curtail opportunism, which will still drive the world's economy, but to establish a new order; a new priority, the need for which has not yet become apparent to everybody. It must be clear to everyone that this change is not being arbitrarily imposed to regulate business, but that the seemingly subtle signals from nature must be recognized; the necessity to follow its directives is absolute.

During the latter part of 1989, a news item told of the very high incidence of retinal eye burn which occurred during a passing of an "ozone hole" and although a few people clucked their tongues, no world wide movement was initiated. With no directly responsible party to blame, such as there was with the Bhopal incident, alarm is much more difficult to raise. Probably, the death of a large number of people in a concentrated time and locale, and a lingering threat to others, will be required to stimulate serious legislation or a public boycott against an entire class of industry, or more drastic yet, an entire economic base.

The general public appears to be jaded at worrying over probable world catastrophe from 40 years of cold war. Everyone crossed his or her fingers, held tightly, and prayed that in spite of mounting arsenals, no nuclear device would ever be unleashed to mark the beginning of a cataclysmic end to life on the planet. Until such a device was exploded, any degree of hazard, no matter how great, remained only potential. The attitudes that such potential situations breed must not be allowed to carry over to meet the threat of environmental catastrophe. Presently, the damage to a large degree, has already been wrought and we are now awaiting the ghastly dividends. The view that we have already overstepped the bounds of return, is gaining in popularity. Even among younger people, who tend to be optimistic, such as masters' students in environmental studies, the idea that should the possibility of environmental redemption exist, the political will to marshal the necessary world forces away from diversions cannot be achieved. It is of no small significance that our most hopeful people should find themselves relegated to playing the ancient role of Cassandra.

Another developing dilemma is that maintaining the long term interest of the public, on complex issues which take years to unfold, is nearly impossible. The news stories are bombarded with statements made by anybody who has anything to say about global problems. The dissemination of information will, and should continue. The unfortunate result is that the public is now tired of trying to interpret statements claiming one day that the greenhouse is on, and the next day that it is off and we are entering an ice age. The confusion is distressing and exhausting.

In time, moralistic repugnance will play a role in the social movement for change, and it will help to convert a number of minds. Unfortunately, it will also serve to antagonize other people, especially those with direct conflicts of interest; those often in positions of power. With global problems, those in power may constitute entire nations. It would do us well to try to understand their point of view, if only to gain insight into how better to convert them. On a smaller scale for instance, no one could expect a manufacturer to unilaterally incorporate expensive process renovations without a guarantee of buyer support. On an international scale, no nation wishes to risk economic suicide for the same reasons; and no politician wishes to risk political suicide by campaigning in favour of an agenda which is unacceptable to the voters. However, waiting for a "small calamity" increases to the extreme, the risk of entering a zone of no return and jeopardizing the future of civilization.

Because industry and its customers are unaccustomed to paying the higher, more realistic costs of environmental damage, pollution penalties will at first seem to be artificially created impositions; a far cry from the truth to be sure, but it will feel like that to nonbelievers. Eventually, these costs will be reflected at the consumer level ... if only there was a smooth transition to that point. Federal regulations are needed, and these have worked in the past. In the instance of car exhaust emissions, federal regulations ensured that all manufacturers had to incorporate the new limits at the same time; no one had an advantage. Costs were passed directly to the consumer so that profits did not suffer. Car sales remained steady. That is not to suggest that changing an entire economic base from carbon to another energy source would transpire with nary a falter in the pace of consumption, but that it can be done fairly. Competition within an industry need not suffer.

The same principle of fairness can apply on an international scale with any nation which agrees to the limitations. The agreement process becomes more complex with more participants, but no more so than with drawing up a trade pact. Much of the smoothness of the change to new rules depends on international consensus and cooperation, which would serve to mitigate unfair competition. If a world consensus were achieved, agreements could be made for the implementation of meaningful emission control timetables.

Surely, one of the greatest hurdles will be to convince all governing powers of the necessity to prevent global warming, even if the dollar cost is high. The cost isn't really that much for the saving of civilization, but it will strain some of the heavily polluting economies; universal conviction will not be immediate. In all probability, the evidence needed to convince recalcitrants will soon be forthcoming, but in the meanwhile, a socioeconomic system should be designed to evaluate and incorporate research material, set timetables, and which would collect and allocate funds. The need to restore carbon dioxide fixing systems must be addressed and this will require agreements and money. By the time worldwide conviction arrives, there won't be a moment to lose ... the deeper the damage, the longer and harder the cure.

IX. FORESTATION AS A FUNDAMENTAL REMEDIAL FACTOR:

As was concluded earlier, even with total industrial and massive domestic carbon emission reduction, remaining effluents of the burgeoning population, combined with natural sources, will still be sufficient to raise atmospheric carbon dioxide levels ... to produce a Greenhouse Effect. Consider again that a grown man breathes out 1Kg. of carbon dioxide every 24 hours, and 5 to 10 billion people (average weight of 60 Kg., or 100 lb.) would emit 1.2 to 2.4 Billion Tonnes just from bodily function alone, supporting livestock not included. Hence, the continued absolute necessity for atmospheric carbon removal, immediately and in the future, even if civilization succeeds in switching to a more easily sustainable fuel base.

There is no machine to filtre or process carbon dioxide from the atmosphere which would not, by its own fuel requirements and material needs for manufacture and maintenance, pollute more than it cleansed. Nature, with the sun's energy, can accomplish this if encouraged rather than deterred. Given the monumental task of effecting a change in the oceans' carbon dioxide absorption rate, the best carbon fixing mechanisms appear to exist in the form of growing vegetation, chiefly tropical rain forests. Rain forests are considered superior because of the high concentration of carbon-trapping organic material that can be supported by a given area of forest land. It is perhaps possible that much denser temperate forests, than presently exists, could also be grown with soil improvement, but that has yet to be developed.

Examining the rain forest does not easily reveal the cause and effect between forestation, rainfall, and river drainage basins; it's a little like "the chicken and the egg". It is known that the heavy rainfall depends to a large degree, on the presence of the forests, and that the river and its drainage depends on the rainfall, as do the forests. Everything is directly or indirectly dependent on everything else, and the relationship is often unforeseeable, complex, and dynamic. Trying to reinstate a stalled cycle, such as trying to reforest Ethiopia, might prove to be difficult, and very much a case of "an ounce of prevention having been worth a pound of cure". Casual thoughts of resource management's ability to reinstate a rain forest, should the need ever arise, may be largely fantasy. In view of the great probability that the exact conditions to nurture new forests won't be produced or made available at the will of managers and planners, it would behoove us as a civilization, to prevent further deforestation.

Efforts at reforestation may not aim at reproducing a previous condition. Since the specific objective is to capture the most carbon dioxide, development will probably center around this directive. A different forest will evolve, with different incidentals. Perhaps many attempts to control reforestation will be thwarted by shallow minded, hastily concluded planning. Planners may have to bend to accommodate some unforeseen logic of nature, and success will go to those who are best able to read and adapt to actual conditions. In the end, forestry managers may discover that the intricacies of ecologies are too complex to be manipulated. A "hands-off" approach may be the best way, and maybe managers should concern themselves with merely ensuring that the basic growing requirements are encouraged.

As an example of the complexity of all things ecological, consider the topic of forest fires. Such a violent material destruction was once thought to be prevented at all costs which, as information now suggests, was a simplified view. The concept of forest fires must not be considered as being entirely negative; after all, fires have always been around and would have had to be integrally included in the evolution of forests, their inhabitants, and the various living cycles. Some fires are inevitable and some organisms have developed in conjunction with these events. For instance, at least at more northern latitudes, a species of pine would not be able to reproduce were it not for the elevated fire temperatures enabling the seed cones to split open, casting their seeds over the ground. The resulting seedlings are stimulated by the sunlight now able to penetrate where the overhead foliage canopy was denuded by the fire.

Fires have always played a role in forest management, long before the advent of man. This is not to suggest that there was any grand design, but that these fires happened frequently enough that some species of organisms developed to include, or as a result of being able to survive where others didn't, the prevailing conditions caused by the cataclysmic event of a fire. Sometimes, a different ferocity of fire achieves different results. Sometimes, low level fires serve to unclog undergrowth that is threatening to choke "everything else". The taller trees can survive a small fire with just a singeing of the bark and lower branches, and remain as a stately, mature stand.

Perhaps in the future, anthropogenic forest management will improve and be able to direct these fires so that their impact is not so haphazard or random. Perhaps discoveries will show that the apparent randomness is really under a "Chaotic" influence, whose function establishes a subtle yet integral order, as it does in the structural formation of almost all things and all groupings throughout the universe.

To be sure, all fires spew out discouraging amounts of greenhouse gases. However, forest fires, like volcanos, have always been present, and have always been a major source of carbon dioxide for the pre-industrial atmosphere. These incidents must not be forgotten during any attempts to quantify carbon cycles throughout the world. They will always be with us. One of the unfortunate developments however, is that more and greater fires have been happening recently, likely signalling the onset of desertification.

However necessary, desirable, or just inevitable these natural events may be, they must never be equated to the burning of forests for land clearing. Land clearing is a one-way trip which arrests completely any semblance of an ecological cycle, and liberates the carbon that was previously involved in those cycles ... anathema to global balances. In fact, estimates are that 1 to 2 Billion Tonnes of carbon dioxide annually[1,2]could be prevented from entering the atmosphere if deforestation would cease. It should not go unnoticed that this amount constitutes two-thirds of the estimated carbon dioxide overproduction.

It is not impossible that, as carbon dioxide levels increase, plant growth will extract the carbon at higher rates which, combined with the higher global temperatures, would accelerate their growth rate. This would favour the cooling of the planet, acting as a negative reinforcement; a stabilizing influence, but it must be allowed to happen ... the vegetation must first exist.

Increasing forestation will surely be easiest if forests that are already established are allowed to expand over adjacent territory. Included in the benefits of intensifying forestation, will be the preservation of many species of plants, animals, and even tribes of people. Economic benefits derived from the collection of forestry products, vegetable and animal, like tree sap, foods, medicines, building products, clothing fibres, etc., can be included, both in the planning stages, and in realizing the wealth that more naturally evolved forests can offer. The cries are loud now, to save the Yanomami people, and for the public to buy more Brazil Nuts to emphasize the monetary advantages of retaining these rain forests. These cries would be much fortified if they were augmented by the principle that the growing of high density forests by itself, was a valuable commodity as waste management, worthy of financial compensation.

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[1] Stephen H. Schneider. "The Changing Climate," *Scientific American.* (September 1989), 70.

[2] Minister of the Environment Canada. "The Greenhouse Gases," *Atmospheric Environment Service Fact Sheet.* (1986)

Should a reforestation program be accepted, it is important that it be launched as soon as possible; time is of the essence. The longer the delay, the higher the global temperature, and the more hazardous the risk due to effects of positive reinforcing elements, and due to the absence of the main traditional correcting factors ... an abundance of forests and marine life. Also, the longer the delay, the higher the greenhouse gas levels, and the more drastic the corrections needed. It seems entirely possible that the need for increased forestation may impinge on agricultural land previously used for food production. This need not be detrimental to the health of human kind, but it might restrict the more inefficient food production methods, such as the extravagance of raising certain livestock for human consumption of protein. Relying more on grains and legumes for protein is an odious concept to much of western civilization. Unfortunately for poorer nations, Westerners will be so reluctant to reduce their meat consumption that many more people will have to starve before any sense of altruism or necessity prevails, if ever it does.

Curiously enough, the move to reduce beef production will probably be due more to the excessive methane production in the bellies of cud-chewing animals, than to the fact that three to ten times more feed is needed to raise a kilo of beef than other animal protein such as pork. It is noteworthy that much of the deforestation taking place today, as it has in the past, is to provide grazing land for beef production. This land provision often fails miserably because the death of the forest often means the death of the land. The sacrifices made in the death of the forest then are for nothing, as the would-be farmers and ranchers abandon their impotent and eroded land plots, cleared just a few years before.

X. THE NEED TO SECURE WASTE AIR MANAGEMENT WITH ADEQUATE FUNDING:

Achieving a desirable balance of carbon consuming to carbon emitting processes is the prime objective. It is possible theoretically, that if total carbon dioxide emissions were to be sufficiently reduced, so would the need for some of the restoration systems(forests), as might be the case if carbon fuels were abandoned. The resulting excess in carbon fixing ability could be used to manipulate the atmospheric carbon levels downward, or managers may decide to convert some of the forested land to some other purpose.

Any process which captures or involves carbon dioxide should be considered as a waste management system, or an air recycling system. As the natural components of the planet, its waters and its air, deteriorate under the onslaught of civilization, increasingly more people are learning to regard waste management as an important and integral part of sustaining civilization. But, so far, gas management has only been considered in terms of emission reduction; there has been little mention of air recycling.

Air recycling, the natural process of growing vegetation, has been so taken for granted that the realization of the role of vegetation is not yet commonplace - hence the wanton destruction of the forests. Were these services, that of air exchange, to be rightfully recognized, acknowledged, and funded, like any other valuable service, concern could be enhanced to an appropriate level. This idea may be foreign to the thoughts of many people who are accustomed to the concept that unlimited quantities of fresh air, like all other natural qualities of the planet, are each person's birthright and natural inheritance. This misconstrued notion of natural birthright must be replaced in the face of defiance, i.e., the continued disappearance of the air replacement systems. Forested nations cannot be expected, while struggling with their own economic hardships, to relinquish without compensation, the economic development of their land in order to maintain existence of air renewing forests for the rest of the polluting world.

Finding the political will to declare forests as valuable air recyclers (or waste management systems, or clean air managers), worthy of substantial funding by the waste air producers, will seem impossible at first. Admittedly, the world is being asked to shift a large portion of its economic base in ways that will cause considerable upheaval, and will be disastrous to those nations which are denuded of vegetation and whose economies have developed using highly polluting industries. An entirely new commodity, with an entirely new "raison d'etre," and additional complications of imperativeness, will be greeted with much skepticism, especially since it will cause a profound shift in the distribution of wealth throughout the world.

Not every society is lacking in political will. There are presently nations which are prepared to commit, or have already committed, substantial funds to combat global warming. They will in the future have to commit still more, but their pronounced determination is a commendable beginning and a powerful example and stimulus. Yet still, these nations can be found wringing their hands in frustration and anxiety because there is no social or market mechanism in place to transfer the funds to where the funds would do the most good.

The concept of paying for the assured continued existence of forests, although not unheard of, is still new and relatively uncharted. Experiments with the idea of funding forestry have generally failed because of fears of lost sovereignty. This fear is the result of feeble attempts by ostentatiously rich nations either to pay meagre compensation, suggestive of swindle, or to buy outright plots of forested land, an obvious infringement on sovereignty. Buying the land is not necessary or even desirable. If compensation for waste air management were sufficient, landlords would be happy to maintain their forests to the exclusion of incompatible land usages. Instead of buying the forests, payment should be for services or renewable leases.

XI. A MARKET SYSTEM TO ACHIEVE ATMOSPHERE RESTORATION:

In fact, the actual service in demand is waste air management, the removal of atmospheric carbon dioxide, and the payment should be exactly for services rendered. In some areas of the globe there are groups of people who are not only responsible for "fouling the yard" but are also prepared to pay for the cleanup, and in other areas of the globe there are groups of people with the ability to do the job. All that is needed then, is a mechanism to effect the transfer of funds for services ... money for carbon fixing ... and this is starting to have all the sounds of a market commodity.

In speculation, the reason that this market commodity has not come to the fore is because of the unsure demand. With an unsure demand, there is no way to establish a realistic value, and few are about to pay far any cleanup as long as others can continue to pollute at will. If responsibility could be established, polluters could then shop for the services needed to meet their obligations. A method of establishing obligations is needed, as well as a method for distributing the proceeds ... a sort of market or bureau.

As yet, their has been no recognition of the need to create a whole new bureaucracy, especially for the express purposes of dispensing large sums of money by the very same nations which control these worldly affairs. After all, who needs to look for ways to spend more money? The factor not available before, is the recognition of this need; this cleanup need which is mounting in urgency every day - the "Greenhouse Effect".

Now, given the magnitude of the problem, the massive effort required to correct it, and the short time to effect the change, the only solution is one that involves ongoing substantive penalties and rewards for all nations ... a global imperative.

Merely preserving and increasing rain forests alone will solve only half of the problem.

Eliminating industrial carbon emissions will not solve the problem, without preserving the forests.

However, a serious effort to combine these two corrections can solve the global warming problem. In other words, all nations and their ecosystems must be involved if the long term health and survival of civilization is to be assured. All nations should be assessed for their role in the carbon cycle and should be rewarded or penalized accordingly. The penalties should pay the rewards.

In the foreseeable future, all carbon emitting nations would send the funds to tree growing nations as the carbon fixers. Voluntary participation would be ideal but, expectations of such would hardly be realistic. Dissenting or reluctantly participating nations may require forceful impetus, such as international condemnation, or trade sanctions. Any nation which is not part of the solution, will likely be regarded by the others, as part of the problem. The word "coercion" will be bandied about, and will probably be applicable, regrettably, on occasion. Those nations producing pollutants will, by the rest of the world, be demanded to pay their share of the cleanup costs.

An inextricable link tying the need, demand, and value, of carbon removal services to the penalties paid for carbon production, would ensure that the greenhouse problem is being attacked from both its sides. The more need for corrective action, the higher the basic value of waste management services, and the higher the basic penalty fee. The stabilizing forces produced by this link behave as negative feedback; upon the rise of pollution levels, polluters would have to pay more not only for producing more, but also for the higher penalty rates due to the increased need for corrective action. This progressive fee rate would be the surest way of not only establishing responsibility for polluting on a national basis, but also ensuring that sufficient funds are always available to pay the increased demand and value for the cleanup, and that the cleanup facilities will be encouraged to expand to meet the increased need.

The obvious deviations from an entirely free market driven system are the penalty enforcing regulations. Whereas an ideological confusion may exist with the inclusion of such regulations in a market system, the expectation that all polluters would dutifully and willingly pay-up consistently is naive. It would be like expecting all citizens and corporations to volunteer their fair share of taxes annually, with no prodding from the governments.

Collecting cleanup costs for a common area is impossible without some agreement. The agreement in this case, would be that each nation would agree to pay for its contribution to the problem. All the money would be spent on rectifying the problem, plus administration costs. The basic philosophy is not unlike that supporting the concept of paying taxes to a federal administration which then conducts infrastructure maintenance, or whatever. In this case, all nations are to be taxed according to their damage contribution, and the international organization then applies that money to effecting a cleanup. This agreement having been achieved, will supply a guaranteed demand for services. The market can then be demand-driven; the demand being created by the insistence on the use of carbon fuels.

The price would be allowed to fluctuate, as it would in any demand driven market. The greater the demand for the commodity (carbon fixing), the higher the unit price so as to stimulate an increase in the commodity supply. Should the supply ever approach or overtake the demand, the price shall fall with the drop in demand. The essential functioning of a supply and demand market is maintained. Incorporating the cleanup cost into the cost of the fuel would ensure responsibility. The decision to incorporate this cost would be made at a national level, in any free enterprise system, and this addition would probably become known as a carbon tax. The decision to buy the commodity is then made when deciding to use the fuel, as an inherent cost of the fuel.

Such a marketplace, whose commodity is waste air management or carbon fixing, could provide the mechanism for the transfer of funds from carbon producers to carbon extractors. Due to the international nature of this scheme, buyers and vendours would probably be restricted to national governments and their agents. Another assumption to maintain for ease of discussion, is that the growing of dense vegetation is, for the time being, the only effective means of extracting atmospheric carbon dioxide, and references to forest growing may often mean carbon extraction.

Probably, the most difficult aspect of operating this market, will be in establishing the exact need for the commodity, which will to a large extent, determine the going price. The price depends on the supply shortfall. The supply shortfall shall be that difference between actual existent carbon fixing ability, and the carbon fixing ability that is desired. Determining this degree of desire, or urgency, is the difficulty. Decision makers will have to balance the advice of scientists seeking ideal environmental conditions at all possible speed, plus commodity suppliers seeking the highest price, against the wishes of carbon emitters seeking to moderate these demands in order to keep the price low. This would be the only condition or action that is abnormal to any other free market, and can be made by a panel of representatives, chosen by whatever criteria seems appropriate, which may include nationality and scientific qualification. In some ways, this decision process would not be very unlike setting fishing quotas, subject to the same fights and corruptions, but a necessary process nevertheless. The effect on the price would also be similar. Should the demand far exceed the supply, prices will soar.

A number of devices are needed to help operate the market. Detailed measurements of carbon dioxide emissions can be made with a variety of methods from audits to satellite recordings. Detailed quantities of carbon fixing abilities would have to be mapped. The difference between the two total figures, heavy on the emission side, will describe the basic total problem, at least in estimate. An annual shortfall of 3 Billion Tonnes of carbon fixing ability could be expected.[1]

The immediate intention of the market then, would be to offer sufficient incentive to ensure the continued existence of the present supply of carbon consuming vegetation, and to stimulate enough new forest growth in order to alter the carbon imbalance. Forests aren't grown overnight, so there will be a lag in new carbon fixing ability which will have to be taken into account, with whatever other pertinent factors, during construction of market influencing formulae. These formulae will be used to establish schedules or quotas. The commodity price will stabilize high or low depending on the likelihood of quotas being met.

When enough time, depending on the sophistication of the measuring devices, has passed to be able to verify the results of tree growers' efforts and their effects, new quotas could be posted, modified to influence the market trend in the desired direction.

As can be expected, the polluting nations will resist and bureaucratic difficulties will arise. Normally, a market is driven by the desirability of the commodity. In this case, the commodity desirability is so subtle and difficult to assess, that it has to be measured and enforced by international consensus. This is the regulatory factor that all other preceding markets have not had to use. The value of other market commodities, such as gold, oil, or strong company shares, has always been easily apparent, which decided its market value through supply and demand. In this case, the desirability has to be determined by a consensus of the signatories and the strength of their conviction to achieve certain atmospheric carbon levels. If the high levels of carbon dioxide seem reluctant to fall, the market value of air recycling will have to climb to stimulate additional forest planting. When new quotas are posted reflecting the urgency, penalties will rise at the same rate as prices, since they are one and the same, to provide the funds to buy the services.

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[1] Stephen H. Schneider. "The Changing Climate," *Scientific American*. (September 1989), 70.

It is possible that as the world moves to a more sustainable fuel, an excess in forested areas or carbon fixing capacity might exist in the face of a reduced demand. It is difficult to imagine such effective pollution control, considering the mounting population and the emerging third world peoples looking for increased technology. Should it happen however, a reduced demand for air purification would be reflected in a reduced market value, and forested nations may choose to begin doing something else with some of their land.

While contemplating the cost of this air cleaning venture, the fact that the value of the forested land must be high enough to be competitive with other potential land usages, may suggest that the total cost to polluting nations will be very high. This is unavoidably true. The services of the forested nations cannot be demanded without fair compensation. While polluting nations may squirm at the prospect of greatly increased overheads, they should remember the two basic reasons for instituting this new expensive program: the atmosphere is in such dire need of renewal because of pollution, and there is no alternative to a healthy atmosphere and no other method of air purification.

In effect, the land will be rented or leased for the purposes of air recycling. In actuality, the land owner will be paid according to the amount of carbon the land is able to fix. If this method seems excessively expensive or land-intensive, the inherent purity of using natural air cleaning, as opposed to artificial methods, should not be forgotten. Even if a mechanical extraction mechanism could be devised, it would require energy and polluting processes for its construction and operation. Trees however, use solar energy in a most efficient and unique way, and in the foreseeable future, it is highly unlikely that this natural method could be bettered; especially in light of the multitude of important side benefits or by-products that a forest provides.

Let us try to imagine some of the possible details of this new market. As mentioned before, all nations would have to be monitored to determine their own carbon imbalance, either plus or minus. This figure might be expressed in terms of Credits or Debits, which would carry a standard mass value of carbon dioxide, say 10 or 100 Kg., something easy to handle. For example, 100Kg. of carbon dioxide is equal to: 1/10 Tonne, the amount breathed out by a 150lb.(68Kg.) person every quarter, the amount produced by an average North American and his/her industrial support every ten days. Canada produces 912.5 million Debits a year (Note; this is a very rough figure, supposed to represent industrial support, and does not include natural sources, nor does it account for any Credits due from Canada's own forests). The worldwide carbon dioxide overproduction is currently said to be 30 billion

Debits annually, or 3 Billion Tonnes.[1] (Should the terms Credit and Debit be found awkward or confusing, any other words could be used, hopefully ones which are easily used and meaningful)

Determining a monetary value will involve at least these few basic considerations: current imbalance, current overproduction rate, and objective. Knowing these would permit an annual quota to be derived, expressed in terms of either excess carbon produced or carbon fixing capability shortfall, which when compared to the world capacity to maintain and grow forests, will establish a market value for a Credit/Debit.

XII. SAMPLE CALCULATIONS TO ILLUSTRATE PRICING PRINCIPLES:

As a rough, hypothetical example, imagine that the carbon dioxide overproduction is 3 Billion Tonnes/year, that the current level is 370ppm, and that the desired level is 310ppm, the same as it was around 1950. Assuming 740 Billion Tonnes of total atmospheric carbon dioxide, the overproduction rate is about .5% each year. Set the target date for 2050. If we could have full carbon reduction immediately (i.e., if we could have ready-made forests right away with no growing time necessary), it would require enough new forests to convert an additional 5 Billion Tonnes of carbon a year, every year. In actuality, the computations would be substantially more complex, having to account for different lag factors, cycles, and other variables. Although this problem as stated is fairly realistic, it is complicated, and with such a high carbon overproduction, an impossible amount of forests would eventually be required. Let us look at a simpler example to get a feel, and return to this one later.

Apparently, the world's total carbon dioxide yearly release is about 6 Billion Tonnes. If the current deforestation were to cease, keeping 1 - 2 Billion Tonnes from entering the atmosphere, and if mankind was to reduce its emissions by 1 - 2 Billion Tonnes, there would be no overproduction, and the gas levels would remain steady. Carbon dioxide producing nations could pay the forested nations an agreeable amount on a constant basis to maintain their carbon fixing ability. Of course, should a polluting nation manage to cut their emissions entirely, there would be no reason for it to pay anything.

Let's imagine that Brazil's lush Amazon basin contributes 20% of the world's carbon fixing capability, and Brazil, as a major player represents and is negotiating for the forested nations; those whose total carbon contribution is on the credit side. Brazil decides that no more of its forests will be burned, and the Amazon region can continue to process the 600 Million Tonnes of carbon dioxide yearly for $10 a Tonne; equivalent to $1 a Credit, and a total fee of $6 Billion a year. These figures are found to be acceptable to the other nations, perhaps after much haggling, and the going price for a Credit/Debit; the emission of, or the removal of 100Kg of carbon dioxide to or from the atmosphere, is established at $1.

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[1] Stephen H. Schneider. "The Changing Climate," *Scientific American.* (September 1989), 70.

Let's assume that Canada's 25 million inhabitants release 4 Tonnes each, every year, totalling 100 Million Tonnes. Let's say that the value of Canada's forests, being too far north to be very effective carbon grabbers, is 1% of the world's total carbon fixing ability, and provides recycling of 30 Million Tonnes. Canada's total responsibility, emissions minus fixings, is 70 Million Tonnes, or 700 million Debits at $1 each.

Looking at the USA, with 250 million inhabitants at 4 Tonnes each, and .5% (Hypothetical case, remember) of the world's forests, the total commitment would be (amount emitted minus amount fixed) 985 Million Tonnes, or 9.85 Billion Debits at $1 each.

Any nation that had forests with a carbon fixing ability to match its emissions, would be attributed neither Credits, nor Debits, and wouldn't be affected by the scheme at this time.

An international organization could handle both the technological (measurements) and the legal affairs, and act as a marketplace, a place of business, and bank; perhaps the World Bank. It would monitor emissions and forestation, and issue Credits and Debits appropriately. Appeals could be brought before this organization, to settle disputes, probably over measurement differences. The concept of a World Atmosphere Fund is not new, but this method of attributing responsibility and generating funds is.

The bank could collect all Debit payments (in reality, polluting fees), through installments or whatever, and dole out the Credit payments (in reality, waste-handling fees). Loans could be arranged in the form of advanced or deferred payments.

Taking the experiences discussed in the last few paragraphs, let us address the original example of trying to reduce the carbon dioxide concentration to 310 ppm by the year 2050. Assume that deforestation, in light of the new investment value, has stopped , and through energy conservation, total emissions have dropped by 2 Billion Tonnes, and gas levels have stabilized. Scientists however, warn that droughts are worsening, or for whatever reason, and that the 310 ppm must absolutely be pursued.

Achieving 310 ppm in sixty years, will require an average yearly reduction of .5% of total atmospheric carbon, or about 3 Billion Tonnes, equivalent to 30 billion Credits. The scheduling of the target, or the desired rate of change, will determine the demand on the credit (100Kg of carbon dioxide). The reaction of tree growers, and how readily they commit to fill the demand, will in turn influence the price for their service.

The previous rate of $1 a Credit was only enough to buy waste management for 30 billion Credits. To meet the new demand to process 60 billion Credits a year, will require much more land to be devoted to forests, and a higher incentive will be needed to coax the land from other occupancies.

Also, $1 a Debit penalty (recycling costs) was able to influence emission restrictions only to a certain degree, the remaining pollution and cleanup costs having been found acceptable to consumers. Raising the value of a Debit would act as stronger incentive to further reduce emissions. The effect of the higher value of the Debit then is two fold: pressure is exerted to reduce emissions, and incentive is provided to boost forest growing. -
The difference between paying these fees and paying a traditional tax, is that all of the funds, minus administration costs, are directed entirely toward minimizing the need for the fees. It is important to maintain the direct relevancy between the fee, and the emissions, and the correctional service, for this whole program to maintain purpose and direction, and for it to be found acceptable to all players.

In order to reduce the total atmospheric carbon dioxide, or its concentration, the amount of carbon being fixed will have to surpass the amount being emitted. Peoples who don't pollute, should never be charged (they often have no means to pay, anyway). Following the principle that only polluters should pay, since they are financing their operations by polluting, establishes responsibility for payment to overbalance the carbon fixing capacity. A shift in calculations will be required to reflect this new emphasis. Whereas the previous method of calculating responsibility by assessing each nation's ability to balance their emissions with their fixings, this worked well only to halt the rise in gas levels by equalizing emissions to corrections. To actually reduce the level, new formulae may have to ignore each nation's ability to fix, and new modified Debits, based only on emissions, could establish the responsibility for further carbon level reductions.

For example, let's pretend that Canada produces 2% of the world's emissions, but has forests enough to cancel the emissions. If the concentration of carbon dioxide was at a satisfactory level, there would be no fees, no Debits. However, should it be deemed necessary to reduce gas levels, not just to maintain them at a static point, by increasing forests and carbon fixing by an additional 30 billion Credits, Canada's new commitment would be 2% (emissions without correction) of the 30 billion Credits excess needed for gas level reduction - 600 million Debits, which is added to their previous account, calculated with forest correction, of zero.

Canadians might, in this instance, protest the purposeful disregard for their valiant efforts at maintaining sufficient forests to counter their carbon emissions. During this time, every other nation is undergoing the same reevaluation which ignores their carbon fixing factors, and this modification is then added to the basic calculation which did include corrective factors. If the emissions did not exist in the first place, there would be no need for restorative actions, or even for this whole scheme.

Let's imagine that Brazil, which has been fixing 1/5 of the world's carbon dioxide, and has been collecting nearly 6 billion Credits annually, also produces 2% of the world's total emissions. Although their level of industrialization and their heating costs are much lower than that of Canadians, their higher population produces much the same emission level as that of Canada (hypothetical). Brazil's previous credit was 6 billion minus 600 million, or 5.4 billion Credits. The new Credit total would now be 5.4 billion minus another 600 million (their 2% of carbon contributions), to equal 4.8

billion Credits. As with Canada, all carbon producers would have to pay an increased amount to increase the value of the credit which assures increased forestation funds, in order to overbalance carbon emissions and produce an actual reduction in existing carbon dioxide levels.

XIII. ADDITIONAL MARKET FUNCTIONING DETAILS:

The same effect could be achieved by applying a factor, in this case a factor of 2, to the value of a Debit, while leaving the value of a Credit at normal value. The perception of the complexity of these modifications would rely on effective wording. A number of methods could be used to stimulate a demand change and price change. Besides applying factors to Debits, which alters the commodity demand, the quotas can be adjusted following whatever criteria seems appropriate, which would alter the price. (It will seem unfortunate to free-business thinkers, that the market should be tampered with, artificially and for destabilizing purposes, but the reason goes back to the fact that the subtle but urgent demands of nature needed to be recognized and legislated. This was the original reason for instituting this program.) For instance, natural growing cycles will demand that quotas are scheduled accordingly and responsibly, or the market will fluctuate too erratically to effectively regulate the program, and debts and payments would be impossible to budget.

Establishing these quotas (yearly targets) will have the strongest influence on the setting of the value or price of a Debit/Credit, and so, will have to be done very carefully. Scientists, statisticians, and economists will have to consider such things as: actual conditions, plan-of-action or agenda, modified by realistic appraisals of the world's ability to respond, etc.. The function of setting a quota is not just to provide a researched guideline, but also to influence the market value so that investments are properly directed as a corrective force.

Changing atmospheric gas levels is not a speedy event so there would probably no need to set new quotas more often than semiannually or quarterly. The commodity value would be free to float and assume its own levels, according to the influence of supply and demand. It would be good at this point to remember again that this whole venture wouldn't have started without the understanding that it was absolutely necessary, and that the polluting nations agreed to support the program, at whatever price was required.

Since funding is guaranteed for the published quota, the floating value will reflect the tree growers' tendency to meet that quota. If with one quota setting the going price of a Credit was too low to secure enough carbon fixing, the price will climb until more forests are committed. As fulfilment of the quota with the end of the guaranteed funds approaches, the price will fall with the declining urgency in demand. Forest growers who delay announcing their commitments in order to drive up prices, will run the risk of being displaced by more eager growers. There would be many, many details to be resolved, probably on a continual basis, as new situations and realizations arise. For example, if a quota system experiences an over-quota growth of forest, how will the surplus grower get paid? After all, that surplus growth is worth something and will also serve to lower subsequent quotas. Perhaps the value of surplus commodity should be reduced, or full value could be awarded but withheld until the posting of new credits, or whenever a new market cycle is commenced.

It is difficult, without experience, to envision the timing of all these events. The decisions effecting the quotas and prices will involve complex considerations, factual and speculative. For instance, since the growing of trees is fundamental to the program, some primary cycles will be lengthy; these restorative growths won't be fully available until years after their planting. This type of lag, if improperly anticipated, could cause erratic market behaviour, especially if compounded by other unanticipated cycles, and could result in the development of an extreme condition. Unrealistic expectations of growth speed could, for instance, result in a far higher carbon dioxide level than intended; a condition which, as described earlier, could become intolerable.

Initially, there will be an explosion of research and discovery. The coordinating bureau, market-operators, or bank, will develop methods to measure both carbon dioxide effluent and intake, probably using a myriad of new films, cameras, recording devices, and computer programs. Private and government agencies will parallel some of these efforts, and some will work hard to develop vegetation with the highest rate of carbon exchange. With so much money involved, there surely will evolve a cadre of dealers, lawyers, and brokers who will plead the cases of their clients, mount appeals, arrange for credit (loans), and generally involve themselves in this flow of wealth.

Representatives of paying nations will be arguing their cases and ensuring that they are being charged no more than necessary. The charges will be high enough that fuel conservation efforts will become valuable. Research into "sustainable" fuels will be immediately intensified, and will become a national objective throughout the world. Some nations will be hopelessly swamped in debt and will need assistance. These will be nations which have polluted their land and waters, and whose industry has developed with no regard for emissions, amongst which will be found E. Germany, Rumania, Czechoslovakia, etc..

As suggested before, the cost to fund this program will be staggering and relentless for many years. The greatest relief will arrive with the adoption of a more sustainable fuel; probably solar-generated electricity and hydrogen. Fusion may yet rise to prominence, but there may develop serious resource shortages during the research, development, and even manufacturing of the reactors. If this adoption takes too long however, the gas levels will be too high to easily reduce, and the program will have to continue for a distressing period of time. It is expected that even after the adoption of a clean fuel, there will still be a substantial carbon emission, depending on population levels for example, and there will still be a need to guarantee the continued existence of sufficient forests, albeit at a reduced quantity.

Actually, the continued need for extensive forestation might remain high, as is suggested by considering some important generalities. Data is scarce, to allow extrapolation, but there surely is a finite amount of carbon that can be processed in a given period of time, once a forest has grown to full maturity. If the claim that soil in temperate growing zones has been demineralized is true, re-mineralizing the soil with pulverized rock might enhance the growth capacity substantially. However, with only a finite amount of arable land to share with agriculture and other occupancies throughout the world, the competition for land occupancy could become fierce. With so much of the previously underground fossilized carbon that will have entered the atmosphere, the ability to process it all back to the ground in the form of vegetable material is not a surety. Long term greenhouse gas levels may have to remain higher than is ideal.

XIV. PROFOUND SIDE EFFECTS TO REFORESTATION:

While the implications of this proposal are being pondered, it should be noted that a secondary effect of profound proportions will occur; the flow of wealth from south (tropics) to north (industrialized or developed) will to a large degree, be reversed. Of course, this won't be happily greeted by short-sighted opportunists who have relied on the exploitation of the third world, but it will be heralded by anthropologists. They have been warning the world of pending disaster due to a backlash from the intensifying human tragedy in the poorer nations, not to mention the fact that it is morally repugnant to allow the tragedy to continue. An opportunity to climb out of debt, in a dignified fashion, will be presented to those nations which can grow trees. This offers little hope for now to nations which cannot grow forests, like the Sudan, although they may benefit indirectly through improved rainfall patterns, but at least these nations tend not to be high carbon producers, and their debt will not be increased by the program.

There are yet other side effects of enormous importance and advantage to implementing this program: forests provide unparalleled refuge for a far greater number and variety of organisms than any other terrestrial environment, forests increase the exchange of water between earth and sky, and forests are the best protection from soil runoff. Also, acid rain resulting from the release of sulfur, that always accompanies the presence of carbon as an essential component of organic structures, will be reduced along with the carbon dioxide, as the burning of forests ceases, and the use of more sustainable fuels is adopted. The most serious emissions of carbon monoxide and methane will be eliminated with the cessation of forest burning. This will all happen as a matter of course, without any added effort or need for additional legislation.

Eventually, other methods of carbon exchange, or air recycling, may be discovered or devised. Perhaps efforts at rejuvenating or enhancing some marine functions might be rewarded, which would be a great relief in view of the improbability of a complete atmospheric restoration through forests alone.

To a great extent, we have to learn as we go ... but, we are going so fast, there is little time for corrections. If we had centuries in which to study all the intricacies and implications of environmental impact, we would be able to adjust formulae, refine techniques, and tweak performance factors, to better predict the future. The timetable however, has been foreshortened by a burgeoning population, hungry for technology and the "good life", and unaware of the incredible burden this places on our planet whose recuperative abilities are limited by natural physical factors.

Scientists have been wrong before, and with the whole problem of global warming being so very difficult to accurately assess, there is the possibility that there will be miscalculations on the effectiveness of forestation. But, compared to other major projects attempted by man, this one is benign in nature. In fact, the beneficial side effects alone are, considered by many people, enough to justify preserving and growing old and new forests. The only possible detriment is that some people will deem the program too hard on some economies, forgetting that those polluting economies have been robbing the rest of the world the whole time, and that those economies are, to a large extent, the reason for the necessity to implement a program like this one in the first place, and they are forgetting or ignoring the opportunities being offered to the third world. Compare these side effects to the hazards presented by other major efforts like the erecting of a large dam, or the development of nuclear power with its indissoluble dangerous waste, or the clearing of a continent for rangeland.

The real danger is that we do nothing. Even with miscalculations, the monetary cost to some societies may be high in adopting this program, but the overall costs will never be too high; i.e., it cannot harm the planet.

THE FOLLOWING IS A LIST OF THE RECIPIENTS OF THE 3rd EDITION PROPOSAL, WITH THE DATES AND POSTAGE COSTS. THOSE WITH NO POSTAGE COSTS WERE EITHER HANDED PERSONALLY OR WERE SENT TO THE HOUSE OF COMMONS. * DENOTES RESPONSE OR ACKNOWLEDGEMENT RECEIVED BY AUG. 9, 1990.

New Yorker Magazine	May	10	1.17	*
Dr. Ross, U of Calgary		10	1.17	*
Dr. Middleton, U of Guelph		10	1.17	*
Dr. Hube, U of Alberta		10	1.17	
F. Oberle, Ministry of Forestry		10		*
Eckhart Stoyke, School Board Energy Consultant		10		*
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Rob Macintosh, researcher, Pembina Institute		11	1.17	*
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Lucien Bouchard, Minister of Environment		11		*
Standing Committee on Environment, Ottawa		11		*
Kai Millyard, Friends of the Earth, Ottawa		11	1.17	
Canadian Environmental Network, Ottawa		11	1.17	
Stephen Lewis, Diplomat		11	1.17	*
Dr. D Suzuki, Toronto CBC		11	1.17	*
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Elizabeth May, Cultural Survival(Canada) Ottawa		11	1.17	*
Peter Newmann, CIL executive, St. Bruno		11	1.17	
Manuel Guerra, influential activist, Mexico		11	1.17	
External Affairs Canada, de Hoog		11	1.17	*
The WILD Project, Vancouver		11	1.17	
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Doug Jenkins, private citizen		12	1.17	*
Dave de Volpi, Private citizen		12	1.17	
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Canadian Coalition on Acid Rain, Toronto		12	1.17	
Energy Probe, Toronto		12	1.17	
Jerry Mander, Calif. author of some influence		12	1.90	*
West Coast Environmental Ass. Vancouver		12	1.17	
Earth Island Institute, San Francisco		12	1.90	
IFSDS, San Francisco		12	1.90	
COICA, New Orleans		12	1.90	*
Watchfire Productions, California		12	1.90	
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Green Committee of Correspondence, Kansas City		12	1.90	
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Duane Pendergast, Atomic Energy Canada and Sheraton Park Research Community	May 22	1.17	*
United Nations Environment Programme, New York	May 23	1.90	
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Brazil, Environment Minister via Embassy	24	1.17	
Brazil, Environment Minister, Brasilia	24	4.20	
World Bank, International Bank for Reconstruction and Development, Washington DC	24	1.90	*
J. Epp, Minister, Energy, Mines and Resources	May 25		*
Prof. T. Veemen, Economics, U of Alberta	25	1.17	
Sweden, Ministry of Environment, Stockholm	May 28	4.20	
Sweden, Ministry of Agriculture (Board of Forestry), Jonkoping	28	4.20	
Allan Sugg, researcher, Swedish U. of Agricultural Sciences, Umea	28	4.20	
Netherlands, Ministry of Environment, the Hague	28	4.20	
Jim Fulton, NDP Environment Critic, Ottawa	May 31		
Pierre Garsonnin, businessman, France	June 6	8.35	*
R. Semeniuk, lawyer, Vegreville, AB	6	1.17	
Dave Hill, Crown Attorney, Edmonton	6		
Ministerio de Recursos Naturalist, Costa Rica	6	4.20	
International Environment Affairs, publication	6	1.90	*
Alternatives, U. of Waterloo, publication	6	1.17	*
T. Corcoran, Economist, Globe & Mail	7	1.17	
Canadian Climate Centre, Downsview, ON	11	1.17	
University of New Hampshire, Dr. Barrett N. Rock	11	1.90	
Madison Center for Human Systems, Prof.Marty Kanarek	12	1.90	
Oregon State University, Climatic Research Institute	12	1.90	
International Center for the Solution of Environmental Problems, Houston	12	1.90	
University of Manitoba, Dr. Henson	12	1.17	*
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Renew America, Tina Hobson, Washington, DC	13	1.90	
Clean Energy Research Institute, Miami University	13	1.90	*
Global Foundation, Inc., Coral Gables, Florida	13	1.90	
Environmental Defense Fund (EDF) New York	13	1.90	*
Marine Carbon Research, Sidney, BC	13	1.90	
Dr. G. Rostoker, Physics Dept., U. of A.	June 20		*
Irwin Kilotat, Environment Canada	Aug. 3		

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Ark. 008.2

13 JULI 1990

Dear Mr. D. Garsonnin,

Thank you for your report "A Proposal to Combat Global Warming". As a personal initiative this is a very impressive and comprehensive document. It is quite obvious that you have studied the problem of global warming carefully.

I will not give a detailed comment on the report. However, your suggestion for a solution has semblance to an international tax on carbon emission where the tax on carbon to sinks is negative.

We are facing large economical, political and technological problems in fighting global warming. In the process of reaching an international agreement all proposals on a solution are welcome, and so is yours.

Yours sincerely

Petter R. Koren

Petter R. Koren
Head of Division

The World Bank
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

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June 18, 1990

Mr. Daniel Garsonnin
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Canada T8N 2W9

Dear Mr. Garsonnin:

Thank you for your letter of May 24, 1990 and attached paper, which has been passed on to me.

We will review your interesting proposals in relation to our own environmental and forestry work, and get in touch with you in due course.

With kind regards.

Yours sincerely,

Mohan Munasinghe
Chief, Environmental Policy Division

United Nations Conference on Environment and Development
Conference des Nations Unies sur l'Environnement et le Développement

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P.O. Box 80
CH-1231 Conches
SWITZERLAND

20 June 1990

Mr. Daniel Garsonnin
6 Akinsdale Gardens
St. Albert, Alberta
Canada
T8N 2W9

Dear Mr. Garsonnin:

Thank you kindly for your letter of May 23, 1990 and the enclosed material. I found it to be a very interesting proposal and certainly germane to some of the issues with which I am dealing.

Once again, thank you for taking the initiative to contact me. Best regards.

Yours sincerely,

Maurice Strong
Secretary General
UNCED

MFS/ds

Bureau/Office address: 160 Route de Florissant, Conches, Geneva

UNIVERSITY OF
Miami

26 June 1990

Mr. Daniel Garsonnin
6 Akinsdale Gardens
St. Albert, Alterta
Canada T8N 2W9

Dear Mr. Garsonnin:

Thank you very much for your letter of 13 June 1990 enclosing your proposal for the remediation of the greenhouse effect. It sounds convincing; at least it will solve some of the problem if not all of it.

In order to give publicity to your idea, I suggest that you convert it to a paper which should included an abstract and references, as well as the idea which would form the basis of the manuscript. In such a case, we will consider it for the new International Journal of Energy Environment Economics, which will have its first issue out in January 1991. Please find enclosed a paper guidelines for your use.

Wishing you the best in your endeavors, I remain

Sincerely yours,

T. Nejat Veziroglu
Professor & Director

TNV:dgp

Enclosure

Clean Energy Research Institute
College of Engineering
P.O. Box 248294
Coral Gables, Florida 33124
(305) 284-4666

- as an addendum to RESEARCH PROCEDURE:

During the search for criticism and viability, nearly 100 copies of the last edition of the policy proposal were mailed or handed out. A partial list of recipients has been supplied as an indication of the level of activity following the issuing of a new edition. Almost all of the responses have been encouraging and congratulatory. Copies of a few of the simpler letters have been attached, and quotations from others are provided below:

"Thank you for your report "A Proposal to Combat Global Warming". As a personal initiative this is a very impressive and comprehensive document. It is quite obvious that you have studied the problem of global warming carefully."

"We are facing large economical, political and technological problems in fighting global warming. In the process of reaching an international agreement all proposals on a solution are welcome, and so is yours."
(July 13, 1990. Peter R. Koren, Head of Division, Ministry of Environment, Oslo, Norway.)

"A very thorough, thoughtful and thought-provoking discussion."
(Dr. Doug Hube, Prof. Earth and Planetary Sciences, U. of A.)

"The idea is interesting and your writing style is good for conveying the message to an audience which is educated but lacks the factual background to understand and put the environmental issues of today into a broad perspective so as to formulate effective solutions to the problems."

"Given your commitment to this idea, I would encourage you to try to develop it further."
(May 22, 1990. Howard Somoil, Environmental Law Centre, Edmonton.)

".... if your document is to have any impact it is essential that you get it to the correct people. Is it possible that you can find a powerful ally? For example, can you get the ear of parliamentary environment critics? You need to find someone who knows the system and who can give you guidance on the steps you need to follow in bringing good ideas to political reality. Many good ideas have disappeared simply because they were not carried forward through the proper channels. At this stage it might be worth your while to enlist the support of groups that already have a high profile and public credibility eg. World Wildlife Fund and its program for forest conservation. They, too, could help in giving you advice."

"Finally, I hope you will not be discouraged. Realize that you will encounter many obstacles, and that you will have to be persistent. Be prepared to compromise on the ideal, to achieve at least, a workable plan that is moving in the right direction. Finally, take the time to polish your ideas and your document."

"We need individuals such as you to continue to carry the fight. Best wishes with your endeavour. It deserves serious consideration."
(April 19, 1990. Alex Middleton, Ass. Prof., U. of Guelph)

"Your knowledge of the issues is, indeed, impressive, and I greatly appreciate your taking the time to bring your ideas to my attention. They will be kept in mind during the preparation of Canada's Environmental Agenda."
(Lucien Bouchard, Minister of the Environment)

"I have passed your report to several of my colleagues who may choose to comment on it directly to you. I encourage you to continue your study of this very important issue and to carry on with the all-important task of informing people of the nature of the climate change threat and the types of steps they can take to alleviate this problem"
(A.C. de Hoog, Director, Energy and Environment Division, External Affairs and International Trade Canada.)

".... I have asked my officials to review the enclosed "Proposal to Combat Global Warming." It is indeed an ambitious proposal; you have obviously given much thought to the subject."
(Frank Oberle, Minister of Forestry, Canada)

"Thank you for your letter of May 11, and for the paper elaborating your proposal to combat global warming. Maureen O'Neil has passed your paper on to me, and I found it extremely interesting."

"You explain very well, for a non-expert like myself, the dimensions of the problem."

"Maureen O'Neil has suggested that we pass your latest paper on to David Runnalls at the Institute for Research in Public Policy, 275 Slater Street (fifth floor), Ottawa. He is deeply involved in parallel work to yours, and is working in particular for the 1992 Conference on Environment and Development. You may well be in touch with him already, but in case you are not, we will send him it."

"Thank you again for writing."
(Clyde Sanger, Director of Communications, North-South Institute, Ottawa)

"Thank you for your letter and attachment of June 12. May I say with respect that I think it admirable that you have taken the initiative of preparing this proposal. There is a good deal of thought-provoking material in what you have to say."

"May I say again that I was very interested in your idea and hope that you will pursue it to the point of refinement perhaps in the directions I suggest."
(June 22, 1990. Dr. W. R. Henson, Director, Natural Resources Institute, U. of Manitoba)

"Thank you for your long and thoughtful response to my modest suggestions. It is perfectly clear from your letter of July 12 that you understood my points and I look forward to seeing your future redraft."
(July 19, 1990. Dr. W. R. Henson, Director, Natural Resources Institute, U. of Manitoba)

"You have taken a very rational and measured approach in assessing the problem and in recommending a game plan to deal with the envisioned future."

"I hope these thoughts give you some extra ideas which might be helpful as you pursue your goals."
(Dr. Gordon Rostoker, Director, Earth and Planetary Sciences, Physics Professor and Department head at U. of A.)

"Good luck with your work, I appreciate sharing your thoughts with us. Please send along any further iterations of the proposal, although I can't promise a rapid turn-around"
(Rob Macintosh, Executive Director, Pembina Institute For Appropriate Development, Drayton Valley)

Daniel Garsonnin

Aug. 9, 1990

NORTH-SOUTH INSTITUTE / L'INSTITUT NORD-SUD
55 Murray, Suite 200, Ottawa, Canada K1N 5M3 (613) 236-3535 Telex 053-3300

June 11, 1990

Mr. Daniel Garsonnin
6 Akinsdale Gardens
St Albert, Alberta
T8N 2W9

Dear Mr. Garsonnin:

Thank you for your letter of May 11, and for the paper elaborating your proposal to combat global warming. Maureen O'Neil passed your paper on to me, and I found it extremely interesting.

You explain very well, for a non-expert like myself, the dimensions of the problem. My single comment would be that your scheme for pollution fees stands (or falls) by having an effective fee (or tax) collection organization. I did not see, on page 18, much attention to this point.

I gather that the Commons Standing Committee on the Environment, under David MacDonald MP, has been studying global warming as a priority subject and is likely to produce its report in the next month or so. Greg Wirick, of the Parliamentary Centre here in Ottawa, has been the researcher/scribe of the committee. I don't know whether you have been involved in any way with the work of this committee, but I give you these names, anyway.

Maureen O'Neil has suggested that we pass your latest paper on to David Runnalls at the Institute for Research in Public Policy, 275 Slater Street (fifth floor), Ottawa. He is deeply involved in parallel work to yours, and is working in particular for the 1992 Conference on Environment and Development. You may well be in touch with him already, but just in case you are not, we will send him it.

Thank you again for writing,

Yours sincerely,

Clyde Sanger

Clyde Sanger
Director of Communications

ENVIRONMENTAL DEFENSE FUND

257 Park Avenue South
New York, NY 10010
(212) 505-2100

Frederic D. Krupp
Executive Director

July 23, 1990

Mr. Daniel Garsonnin
6 Akinsdale Gardens
St. Albert, Alberta   Canada   T8N 2W9

Dear Mr. Garsonnin:

Thank you for your letter to EDF's Executive Director, Fred Krupp. I am very sorry for the delay in our response, but because we receive such a large volume of mail and because Mr. Krupp's schedule often takes him away from the office for long periods of time, we sometimes get behind. Mr. Krupp is currently out of the office again for several weeks, therefore I am writing to avoid further delay.

Thank you for sharing your proposal on global warming with us. I will forward it to the staff people working on this important issue for their consideration. If they have comments or recommendations for you, they will be in touch.

Yours truly,

Diana Widener

Diana Widener
Executive Assistant to
Fred Krupp

/dkw
cc: Rod Fujita

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CLEAN AIR STRATEGY FOR ALBERTA

Prepared for;

ALBERTA ENERGY
and
ALBERTA ENVIRONMENT

Prepared by:

EUGENE GAWOR, M.Sc.,P.Eng.
Representative of:
E.E.E. Services
8 Woodford Close S.W.
Calgary, Alberta
T2W 6E1

December 05,1990

December 05,1990

CLEAN AIR STRATEGY FOR ALBERTA PRESENTATION

Mr. Chairman,Members of the Committee
Ladies and Gentlemen

It is a real pleasure for me to be with you this evening in order to share our common concern, which is our care about clean air.
We all want to breathe clean air.

1. Introduction, general remarks.

Are we really serious about clean air for ourselves, our children and future generations?

Don't wait, use new and modern technology, implement new strategy into Clean Air Act and Environmental Protection Act.

Ladies and Gentlemen;
It is fortunate that these days there is more appreciation and understanding for environment, clean air,improved energy efficiency and energy conservation.

Motto: There is no cheaper barrel of oil or unit of energy from energy we conserve.

Therefore improved energy efficiency has to be the driving force in abating air pollution, in helping clean air, in helping our environment.
It is hard for specialists of energy conservation and environment to agree with some politicians who think that pollution is cheap and clean air and environment expensive. Further, polititians believe that the only way to reduce power plants emissions is to raise consumers electricity bills to pay for scrubbers installed on smoke stacks.

I am going to give you some numbers in order to substantiate the above wrong conclusion.
In 1988 USA industry polluted own country and neighbours, as follows: 20.7 mln ton of SOx
19.8 mln ton of NOx.

(.....continued)

According to new 1990 Clean Air Act, USA is going to reduce emissions as follows:
SOx by 10 mln ton/year
NOx by 3 mln ton/year

USA Government is planning to spend 19 billion dollars to help environment.
Some members of the Congress are crying already that after implementing new Environmental Protection Act the costs will go up to (80 - 100) billion of dollars.

The other side of the coin is as follows:
Health costs only of doing nothing to clean the air cost USA Government over 100 billion/year. Here we should also know that more money is wasted on inefficiently used energy than on entire military budget of 10,000 dollars/second.
It means that more than 315 billion of dollare is wasted each year, despite that energy efficiency was improved since 1974 by giving USA Government savings of 150 billion dollars/year and at the same time the rate of SOx, NOx and CO2 emission was substantially reduced.

Another example of potential savings using today`s technology by improving energy efficiency which is leading to reduction of air pollution.
We can save about 75% of all electricity in Canada by using today`s technology and apply properly to residential, commercial and industrial facilities.
25% saving can be accomplished in lights, 25% in motors and 25% in the rest.
We can save about 75% of the electricity by replacing incandescent lights by fluorescent, e.g 18 watt fluorescent lamp provides the same light what 75 watt incandescent lamp. They don`t only save power but also last 13 times as long as an ordinary bulb.
We save also on maintenance by replacing lights, therefore the total cost is less than zero.
We can use also mirrors, reflectors to improve lighting.

We can save (8000 - 9000)MW in lighting only by using today`s most efficient technology, which is more than Alberta total power installed.

Unfortunately in some industries electric intensity is rising while in Japan and Western Europe is falling, e.g. steel, cement, pulp and paper.

(....continued)

Since 1974 (the first oil crisis) Western Europe and Japan have cut their dependence on oil in half, while USA and Canada's dependence has gone up.
Those countries were keeping gas prices high through taxes, because they were smart to realize that improved efficiency and energy conservation was important in 1974 and is important now.
Presently we at North America are hostages to Middle East oil and will be for years to come until we realize that any nation that is not energy independent is not independent.

I strongly believe and will pray to God for politicians to have a vision of clean, efficient and productive Canada we all dream of , that new issues of Canadian Environmental Protection Act and Clean Air Act will include improved energy efficiency as a major driving force to reduce substantially atmosphere pollution to reduce potentially global warming disaster envisioned by scientists.

2. The barriers to energy efficiency improvement.

a. Lack of information and awareness.
b. Wrong attitude.
Most of the senior management still believe that they are in business of selling kWHr of electricity and want to sell more. Customers however want less electricity and more efficiency. Utilities including Ontario Hydro still pay only up to 10% to save energy and over 90% to make. This is a major mistake in misallocating capital.
c. Lack of specialized services.
Government doesn't have offices with clear responsibility for designing and implementing energy efficiency. There isn't any legislative or regulatory act which would clear address energy efficiency.
Enterprizes also don't have in their organizational structure real energy management offices to look after company energy efficiency performance and potential savings.
d. Technical Know-How.
Technical Know-How is inadequate within government and enterprizes to the need of designing and implementing energy conservation demands and appropriate budgets.
e. Profit
Utility companies make more profit by selling more electricity.
f. Pay - back gap.
If we invest in saving energy we want return in (2-3) years. If we don't invest Utilities must build a new Power Station and get money back in (20-25) years. We shouldn't compare 2 year pay-back with 25 years.

(.....continued)

3. Recommendations in a quest for Clean Air Act strategy in Alberta.

a. Educational and promotional programs.

b. Review and revise the list of advisory group members for clean air strategy for Alberta.
- list shouldn't include representatives who will be in conflict with their own company policy, if they are real promoters of clean air/energy efficiency.
- list should include only liberal and positive promoters.

c. Include members/promoters of increased energy efficiency and conservation in Alberta.

d. Promotion of engineering ethics, attitude and achievements in the area of environment and increased efficiency and energy conservation.
Formerly engineers were heroes of modernization, now have become villains in an age of environmental concern.

e. Revise royalty charges and taxes.
Royalty charges should be reviewed. Presently province is charging royalty for a gas which is sent to pipeline and no charges on gas flared (wasted).

f. Pollution prevention strategy.
Strategic shift from control and clean-up to prevention of pollution is essential to the environment and healthy economy. Energy efficiency is the best and cheapest way to clean the air.

g. Least cost approach to control emission.
The cheapest approach to control emission is to increase efficiency by installing efficient lights, motors, appliances etc.

h. Promote national and international importance of energy conservation.

i. Review and reexamine subsidy programs for energy producers by considering the importance of energy efficiency.
Billions of dollars are spent by both levels of Government subsidizing megaprojects and not checking the potential of increased efficiency and energy conservation, the performance of the company.

j. Research and development programs in searching for new and improving existing technologies.
This is the only way to be competitive in the world today, otherwise we as leaders in oil and gas production today will be buying new technology from our students.

(....continued)

k.Tax breaks on environmentally friendly products which have to be approved by specialized government agencies.

l. Energy efficiency audits, technical assistance and training programs.
All these programs shall be sponsored by the Ministry of Environment in order to monitor the performance of industry in the province. These audits would monitor how much electricity is consumed per ton of physical output. On the other side the same audit would show the pollution of air, water and soil.
Such audits would enable Government to know the performance of the company in the comparison to others and the local and international standards.

m.Profits of the Utility Company shouldn't be a function of supply but a function of demand with least costs combining capital costs and operational costs.
There are some companies abroad that make profit based on saving energy for customers.

n.The decision to allocate capital/investment should be made by properly and very thoroughly calculating least pay-back time, not only on energy supply but on demand as well.

o.Energy future, energy production and energy development should include environmental concerns e.g. pollution costs etc.

p.Foreign aid for developing countries should take into account very modern technology and efficient equipment.

December 12,1990

Clean Air Strategy for Alberta
Bag One,Mail Room,Main Floor
North Tower,Petroleum Plaza
9945 - 108 Street
Edmonton, Alberta

Dear Sirs,

I was not able to attend the November 16 open house but I do have some suggestions for the Clean Air Stategy for Alberta.

Regarding the problem of automobile emissions and greenhouse gases, would it not be possible to ensure that all motor vehicle emissions meet a minimum standard of acceptance?

The cost of meeting this standard should be met by the vehicle owner. It bothers me that so many commercial vehicles such as large trucks are allowed to emit so much visible pollution without any responsibilty to the damage done.

The owners of these offending vehicles, either individuals or companies, must be made to realize that the right to operate them extends to safety for the the environment as well as to people.

The standard could be achieved by a mandatory yearly inspection of all vehicles or by citizens reporting the offending cases to a regulating agency.

Efficiency gains of new improved cars is lost if people are allowed to drive them without proper maintenance.

Thank You

Derek Gomez
11319 - 25 Ave.
Edmonton, Alberta
T6J 5J1

161 Robin Crescent, Ft McMurray Alberta T9H 2W4

January 3, 1991

To: The Clean Air Strategy for Alberta
Edmonton, Alberta

To develop a clean air strategy for Alberta. one must consider the policy of only burning our own toxic wastes and prohibiting toxic waste from entering our province. Pollution control expenses should be controlled by direct taxes on products either to the manufacturer or consumer. Our air should not be in jeopardy because of high consumption in Ontario. Other provinces should bear the expense and be responsible for their own waste.

Canadian and provincial laws should ban the use of hazardous and toxic chemicals which need costly removal methods.

We should be asking ourselves:

Not what our environment can stand
But what our environment cant stand

Yours sincerely,

D. Gordon

X

Clean air strategy
For Alberta.

I believe if diesel fuel was replaced with unleaded gas it would certainly give us cleaner air to breathe

Also if the trains were put back on track, one trip accross Canada would take many passengers Plus thousands of pieces of freight. would eliminate fumes from large trucks + passenger cars.

Also save the damage on roads caused by heavy loads.

Mary Helinsky

Presentation to CASA Regional Session, Peace River   Nov. 13, 1990

by Allan Johnstone, South Peace Environmental Association

I attended the Phase 1 Issues and Options Workshop for CASA held in Edmonton Sept. 5,6 and 7th. Ten of the one hundred delegates present were members of the Alberta Environmental Network. I represented the South Peace Environmental Association . I was the only environmentalist attending this meeting from north of Edmonton - the top half of the province. There was overwhelming agreement amongst the various stakeholders that global warming is the most immediate danger to our planet. The discussions therefore were centered on reduction of carbon dioxide (CO_2).

I have since spent two months travelling and studying the handout monograph entitled "Clean Air Strategy for Alberta." I handed out over 50 copies. I contacted a number of gas plant operators. I was surprised by the almost universal condemnation by knowledgeable oil company personnel of farmers conducting cattle operations as being the major cause of methane gas greenhouse pollution. To satisfy my curiosity about the documentation contained in the methane portion of the CASA monograph, I drove to Fairview and consulted with John Knapp, Director of Alberta Agriculture, Northwest Alberta Division. I gave him copies of the CASA monographs which he distributed to the thirteen agriculturists under his command. In a phonecall last week, he indicated to me forcefully in verbal terms that the percentage of enteric fermentation by cattle operations in Alberta is small. Specific quote, "To attribute massive amounts of methane gas from belching of cattle is ridiculous, and you can quote me." He mentioned that the Alberta Cattlemen's Association in Calgary have produced a technical document on this subject.

It is my opinion, based on consultation with various authorities, that the "Global Annual Methane (CH_4) Emissions" chart on page two of the Methane Monograph is incorrect and that gas and oil drilling, venting, and transmission is the number one cause of methane emission and flaring in the world today. The main source of methane venting and flaring is in Africa where in many countries unrestricted flaring burn trillions of cubic feet of methane and H_2Sgas yearly. Oil production in these countries is usually on a fifty-fifty basis between the oil companies and the local governments. In those cases, where the countries have environmental laws for gas emission, the oil companies comply. In those cases, where the countries have no restrictions on venting and flaring, the oil companies engage in unrestricted pollution in collusion with local governments. In many cases, the local, dictator-type governments cannot be controlled and the onus is on the oil companies to develop an environmental conscience. If not, there should be some type of worldwide environmental body formed who will have the power to hang these companies high in the sun.

Case History of a Grande Prairie County Oil/Gas Well

There are approximately 115,000 oil and gas wells in Alberta. I have chosen a well located two miles east of my residence in LaGlace as an example of what I feel is carbon dioxide pollution. within the law. Paradoxically, the well is owned by Legal Oil and Gas. I have watched this well flaring on a hilltop for six years. The Energy Resources Conservation Board (the ERCB) records indicate this well was completed as an oil and gas well in 1959. The July 1990 ERCB records indicate that the average production for this well over the years has been ten to fifteen barrels a day, approximately four hundred barrels a month of oil. It has been flaring approx. 125,000 cubic feet per day, four to five million cubic feet per month of mostly methane gas. I do not have the complete figures for the past thirty years. I am aware that it has been shut down many years ago. If this well has been in operation twenty of the thirty years, it has burned off as waste over a billion cubic feet of gas into the atmosphere while producing 100,000 barrels of oil. The present monthly revenue of approximately 400 barrels of oil is twelve to fifteen thousand dollars per month for two truck loads of oil. At the same time they are burning off somewhere in the neighborhood of four to six thousand dollars in gas at wholesale prices. In the meantime, the forty dwellings in the little town of LaGlace where I have lived (I moved this week to Woking, Alberta) spend $50-$100 a month for heating at retail prices.

The major natural gas utility in the Grande Prairie area and in fact for a great deal of northwest Alberta and northeast B.C. is Northwestern Utilities, listed on the stock exchange, majority shareholder Ron Southern of Calgary, Atco Industries. In the case of this well, it is my understanding that pipeline-transmission facilities are in place but Legal Oil and Gas and Northwestern Utilities cannot come to terms.

CASA Solution

The production of oil in a well which also contains gas is legally dependent on the gas-oil ratio(GOR). I am assured by the ERCB that this well is legal (no pun intended). It is obvious to me that ERCB regulations in respect to combination gas-oil well installations have to be reviewed with the emphasis on environmental protection over the economics of oil production. The obvious solution in this case is that the ERCB, Northwestern Utilities, and Legal Oil and Gas should ensure the transmittal of this gas. The Amoco Gas Plant ten miles southwest is being enlarged 25% and is looking for gas. Otherwise, a solution strategy I have discussed with a knowledgeable industry acquaintance is the concept of gas garbage storage. That is, specifically, [redacted] if the operator of the new well is willing to burn off his waste gas, he should, in some cases, be forced to give it away to an adjoining pipeline operator. The decision to recommend this action should be the responsibility of the local ERCB office, not Calgary. The local councillor and district agriculturist should also be involved in flare reduction decisions.

It is my opinion, shared by acquaintances in the industry, that there are many more wells in the Grande Prairie area that flare more than the afore mentioned Legal Well. Indeed, it is my opinion that there are thousands of gas/oil wells in Alberta that should be reviewed and re-evaluated in respect to their GOR ratios. This could result, I believe, in a substantial reduction in carbon dioxide emissions in Alberta. No doubt, there will be howls of protest by Calgary-based oil companies surrounding the ERCB headquarters. However, the Environmental Law Society of Alberta have most emphatically indicated in their proposed changes to the Environmental Protection and Enhancement Legislation that the future of our children depends on a separation of economics from environmental law. It is my understanding that the ERCB is responsible to the Alberta Cabinet, and have been above reproach for many years. It has been my experience that they are mortal and subject to human error. I refer to the Calgary Headquarters. In 1980, I received documentation from the Hythe gas-plant proposal that my share of acid rain was five pounds per acre PER YEAR of the 15 ton-per-day output of this plant. Subsequent checking of the documentation of this fallout in a ten-mile radius of the plant was 1000% in error. My property received 50 pounds per acre PER YEAR was documented by ERCB. I must inject a personal note here. I paid $300 a month for ten years on my property (which I abandoned) and I sold the property in Oct. of 1989 for $7000. Six of neighbor associates at the gas-plant hearings ten years ago have experienced cancer. Three have died. I consider myself lucky.

CASA Recommendations

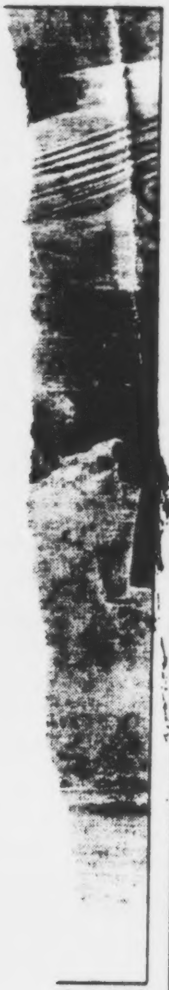
I maintain that methane flaring and venting into the atmosphere must now be considered an environmental crime. I recommend that each councillor in municipalities, improvement districts, and counties in Alberta request documentation from the ERCB of the flaring in their area in both metric and imperial measures. District Agriculturists should cooperate locally in this regard. It should be the responsibility also of farmers to report unusual flaring in the vicinity of their farms to the councillor. I visualize school children and school bus operators cooperating in monitoring wellsite and storage-tank flaring.

I will have more documentation to present at the Phase 3 Summary Workship in Spring 1991.

Allan H J

Allan Johnstone, Box 149, Woking, Alberta
Phone 774-2390

Daily Herald-Tribune, Tuesday, November 6, 1990



ohn Ludwick

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ERCB predicting active oilpatch

By JOHN LUDWICK
Herald-Tribune staff

It should be a healthy winter in the local oilpatch.

That's what the Energy Resources Conservation Board area supervisor Dennis McCullough is predicting.

McCullough says with higher oil prices and the onset of winter, the area can expect to see more activity.

The area the local ERCB office monitors takes in 42,240 square kilometres, extending east from the B.C. boundry to about Fox Creek, and north to manning from Grande Cache.

In this huge chunk of forest, farm and marsh land the ERCB keeps a watchful eye our for about 100 small, medium and large oil companies plus a growing number of service related outfits.

To date 1,891 oil wells and 631 gas wells are in production this year. Oil production in the area ranges anywhere from 62,000 barrels per day in the summer and peaks at about 100,000 during the winter months. Gas production, meanwhile, averages roughly 400 million cubic feet per day.

Perhaps a more telling statistic is the number of shut-in wells in the region. The ERCB says 2,547 oil and gas wells are currently suspended. McCullough expects that figure should soon change.

"As the winter goes on I think you'll see a lot of those suspended wells freed up and start producing with the higher price of oil," McCullough says.

So far in 1990, 311 wells have been sunk in the Grande Prairie district, That figure is down from the previous four years.

In 1989, 457 oil and gas wells were drilled; 612 in 1988; 561 in 1987; and 474 in 1986.

And McCullough says it's unlikely the last two months of the year will see the number of new wells come anywhere close to previous totals.

But in fairness, he attributes the area's slow year to an unusually wet spring thanks to June flooding.

The number of oil producing facilities over the last five years has varied slightly with this year's total expected to come in just under the 1989 figure.

To this point 858 facilities are in production, compared with 875 last year and 1,008 in 1988.

Area gas plants, on the other hand, have seen a steady increase over the same period. October figures show 49 sweet and 22 sour gas plants in operation. That's 10 more than there were in 1989 and 12 more two years ago.

Another area where the district has imporved is in oil and salt water spills. This year there have been fewer spills than in the previous three years. McCullough's staff has only investigated 68 spills – most of them minor – compared with 114 in 1989.

He attributes the reduction to a more environmentally aware oil patch.

"More people are thinking green everywhere, and the oil companies are certainly no different."

The ERCB spends a lot of its time dealing with environmental matters, largely fielding complaints and acting as middlemen between the industry and public.

Its staff of eight inspectors also spends a number of hours on the road checking drilling and production operations, pipeline construction and testing as well as other duties.

The office was moved from Whitecourt to Grande Prairie in the

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RESUME

Allan H. Johnstone 1990
B.L. Site Box 38
Sexsmith, Alberta BOX 149 WOKING T0H 3D0
T0H 3C0 Phone (403) ~~568-3364~~ 774-2390

Experience: --Geophysical Investigator inspecting seismic crews and handling farmers' damage claims against seismic crews, with emphasis on water well damage occurrences. Managed the Grande Prairie Geophysical sub-office for Alberta Energy and Natural Resources, Minerals Division. (See attached job description) 1981-1984. Private consulting, 1985. Retired, 1986.

--Landman, Geophysical Consultant, developing and negotiating drilling plays; recommending drilling locations; surface permitting and damage claims work with farmers. (Central Alberta) 1970-1981.

--Geophysical Service Inc., Geophysical Computer Processing Party Chief and Data Interpretation. (Calgary) 1967-1970.

--Heiland Exploration, Calgary, Seismologist Party Chief responsible for crew operation and geophysical data interpretation for recommending drilling locations. 1956-1966.

Training: --Diploma, Petroleum Geology, Southern Institute of Technology, 1956.

--Computer Technology Diploma from Geophysical Service Inc., Texas Instruments, Dallas, Texas, 1967.

--Alberta Petroleum Landman License #1214, 1973.

--Alberta Realtors License #83176, 1980 (inactive).

Comments: --Foreign Geophysical consulting work in Pakistan, 1977.

--In periods of seasonal and political oil exploration recessions, other experiences include: auto wholesale partsman, hardware sales, oilwell pumpjack maintenance at Lloydminster, Alberta, pipeline labor foreman, and truck driving the Alaska Highway.

References: -Ron Gartshore, Yukon Gov't
Box 14,
Watson Lake, Yukon
Y0A 1C0
Phone (403) 536-2609 or 536-2232

-Craig Christie, Urban Development Consultant
4719-147A Street
Edmonton, Alberta
Phone(403) 437-4541

-John McCallister, Operator of Canuck Crane Services
Box 638,
Grande Prairie, Alberta
Phone (403) 532-8990

-Past Correspondences and References Attached
Enclosure 1-7.

2

HEILAND EXPLORATION CANADA LIMITED

EDMONTON, ALBERTA · CALGARY, ALBERTA

502-42 Ave S.E., Sub+P.O.28,
Calgary, Alberta,
→ 20 Aug 56

Mr.Allan Johnstone,
Heiland Exploration Canada Limited,
Party 104,
Rosetown, Sask.

Dear Al:

It is with great pleasure that I advise you of your promotion from Computer to Seismologist.

I have been looking forward to this occasion since I first had your services on Party 104 when I was Party Chief. It can be said without reservation that the diligence and perseverence on your part toward your duties have obtained their just due in the way of this promotion. Continuation of this same attitude towards your duties in this or any other position you obtain along lifes highways will, I know, return rewards of similar nature.

Also effective September 1st.,1956 your Salary Rate will be increased from $325.00 to $350.00 per month.

Your promotion is effective immediately.

Cordially,

James H. Bush

JHB/Jbh (J.H.Bush) Supervisor.

CENTURY GEOPHYSICAL CORPORATION OF CANADA
P.O. BOX 5700 • POSTAL STATION "A" • CALGARY, ALBERTA T2H 1Y2 • 287-1110

H.Z. Smith, P. Geoph.,
Vice-President,
Seismic Division.

16th June, 1981

TO WHOM IT MAY CONCERN:

RE: ALLAN HUGH JOHNSTONE

I have been acquainted with Mr. Allan H. Johnstone professionally and socially for over ten years.

Professionally, he has acted as a client representative for several seismic surveys which were conducted by Century Geophysical. It was obvious that Mr. Johnstone had extensive experience in all phases of data acquisition and field operations. At the time, he exhibited early concern for environmental damages caused by seismic activity and insisted on good housekeeping practices by the crews.

Socially, I have know Mr. Johnstone as a friend and neighbor and we enjoy a most friendly relationship.

Should you require any further information regarding Mr. Johnstone, do not hesitate to contact the undersigned.

Yours very truly,

CENTURY GEOPHYSICAL CORPORATION OF CANADA

H.Z. Smith, P. Geoph.
Vice-President
Seismic Division

HZS:sm

GEOPHYSICAL SERVICE INCORPORATED
906 - 12TH AVE. S.W. • CALGARY, ALBERTA T2R 1K7
403-243-6640 • TELEX 030-22744

1981-06-25

TO WHOM IT MAY CONCERN:

I have known Allan Johnstone for the past fifteen (15) years, first as an employee and later an an independent consultant.

When I met Allan, he was already experienced in many aspects of oil exploration activity, and he has acquired valuable experience in the ensuing years in the modern arts of digital field seismic data collection and data processing. He also has background experience in seismic interpretation and most recently, as a landman.

He is an individual who works hard, and does so with a minimum of direct supervision. I would consider him a loyal and dedicated employee.

Yours very truly

Lorne G. Morris

Lorne G. Morris
Vice President

LGM/sri

A SUBSIDIARY OF TEXAS INSTRUMENTS INCORPORATED

GEOSOURCE INC.

P.O. Box 1087, Stn. 'M'
303 Forge Road S.E.
Calgary, Alberta, Canada
T2P 2L1
Telephone (403) 253-8281
Telex 038-24757

GEOSOURCE

June 16, 1981

TO WHOM IT MAY CONCERN:

Allan Johnstone is known by this company and more particularly by myself. He is considered to be of good reputation and in good standing. Further information will be submitted on request.

Sincerely,
PETTY-RAY GEOPHYSICAL DIVISION
GEOSOURCE INC.

K. E. Powell

K. E. Powell
Regional Manager

KEP/cw

①

THE ROYAL BANK OF CANADA
8TH AVENUE & CENTRE STREET
P.O. BAG SERVICE 2524
CALGARY, ALBERTA T2P 2M7

IAIN F. McLEOD
MANAGER

June 16, 1981

TO WHOM IT MAY CONCERN:

Re: Allan Johnstone

I am pleased to advise that I have known Allan Johnstone over the past twenty-six years. During that time Allan has been associated with the "Oil Patch" in a supervisory capacity.

He is a hard worker and industrious individual and I do not hesitate to recommend him to a potential employer as being worthy of full consideration.

Yours truly,

career and promotional opportunities

Alberta
GOVERNMENT OF ALBERTA

GEOPHYSICAL INVESTIGATOR

A Geophysical Investigator functions as part of a team covering regulatory work in the field of exploration and provides assistance to those who allege that they have had property damage resulting from Geophysical activity. The Investigator travels extensively throughout Alberta (30,000 miles per year).

DUTIES

- Assesses damages to determine reasonable amount of claim.
- Attempts to reconcile settlements between industry and the claimant by recommending to them the justifiable amounts for compensation.
- Inspects the operations of Geophysical crews, from the commencement of the program to its completion, to ensure that the work complies with the Exploration Regulations.
- Imposes penalties for violation of the Exploration Regulations and/or suspends the operation until the condition is rectified.
- Research departmental records to establish the identity of companies whose previous work is causing current problems.
- Supervises deparmental expenditures related to flowing hole plugging.
- Reviews and approves all artesian well and spring plugging methods.
- Assists in the preparation of regulations and directories governing Geophysical operations.
- Conducts group instructional sessions with geophysical crews advising them of the Exploration Regulation and proper field techniques.

QUALIFICATIONS: Grade 12 education. Courses in water well drilling, hydrology or structural damage. Two years experience in geophysical operations, including experience in land dealings and agricultural evaluations. Effective communication ability is a definite asset. An equivalent combination of experience and education will be considered.

APPLICATION FORMS may be obtained from the Departmental Personnel officers or from any of the Personnel Administration Offices, at Edmonton, Calgary or Lethbridge. Application forms must be received by the indicated closing date, stating position and competition number clearly.

SUBMIT COMPLETED FORMS TO: ALBERTA GOVERNMENT EMPLOYMENT OFFICE
5th Floor, Melton Building
10310 - Jasper Avenue, Edmonton, T5J 2W4

COMPETITION NUMBER EN 4040-2 CLOSING DATE July 20, 1981
PROFESSIONAL & TECHNICAL (U.G. #4) (LJ)

THIS COMPETITION IS OPEN TO ALL INTERESTED CANDIDATES

/06/81

Alberta
ENERGY AND
NATURAL RESOURCES
Mineral Resources Division

File No.

Petroleum Plaza, South Tower, 9915 - 108 Street, Edmonton, Alberta, Canada T5K 2C9 Telex 037-3676 Mailing Address
Exploration Branch, 3rd. Floor, Victoria Place, 10009 - 108 Street Office Location

PRIVATE AND CONFIDENTIAL

April 26,1984

Mr. A. Johnstone
Box 500
Hythe, Alberta

Dear Mr. Johnstone,

The seasonal decrease in seismic activity has necessitated the elimination of your project position as Geophysical Investigator. This letter will serve as a formal notice of your termination effective May 18, 1984.

In order to give you an opportunity to seek alternate employment, there will be no requirement for your services over the three week notice period. Enclosed is a pension refund request form which should be completed and forwarded to the Personnel Services Division, 6th Floor, Petroleum Plaza, 9945-108 Street, Edmonton, T5K 2C9.

Any monies owing you will be processed as soon as possible and forwarded to you.

Thank you for your services over the last few years and good luck in the future.

Yours sincerely,

E. R. Silver
Executive Director
Exploration Branch

cc: K. Cairns - Personnel Services

3404 7th St. SW
Calgary, Alberta
Canada, T2T 2X9.

Dec. 11th, 1990.

Mr. Vernon Millard, chmn,
Clean Air Strategy Hearings,
Bag One, Mail Room, Main Floor,
North Tower, Petroleum Plaza,
9945 - 108 Street,
Edmonton, Alberta, T5K 2G6.

Dear Mr. Millard,

I spoke at the meeting in Calgary. I should like to repeat my main concerns and my suggestion and to apologize for an error. My concern is that we as a Province are not responding quickly enough to the threat of CO_2 legislation. My suggestion is that we may be able to do better than stabilizing CO_2 but that we must use tree growth to capture CO_2 and must not be trapped into speaking of emissions separately form absorption. My error was that I decided that the group had not gathered the required data. At the open house, I thought I was told that you didn't have data on CO_2 produced by gas flaring and several other areas of interest. When I spoke at the meeting, I was immediately presented with a copy of a paper listing all sources in the energy industry. I apologize for stating that this had not been done. I remain concerned that the group may not have data on the emissions by the forest industry, the absorption capabilities of forests and the reservoir potential of drilled formations.

Legislation

I suggest that we were lucky in the Green Plan released today and that targets may be raised several times before 2000. If Alberta doesn't act first there will be a carbon tax which may be more punitive than the NEP. Naturally Alberta will attempt to reason that the CO_2 produced in recovering oil for use elsewhere should be accounted for at the point of consumption. It won't work. In the final analysis the World Price of oil will be stated on a carbon tax free basis and we will be forced to compete. Whatever form the controls might take Alberta's oil will be more valuable if we can show that the Province is in carbon balance and that no penalty comes with purchase of our oil.

The present suggested CO_2 stabilization is stabilization at a level of emission that may be too high. Secondly, this presumes that the Third World will stabilize at their present levels which is most unlikely. If we were required to reduce our emissions to the Canadian average we would be required to go to 1/3 of present emissions. About the time that we have digested that crisis we may find ourselves asked to come down to some new World standard (say 1/6th of our present).

:

Forestry

Ontario Hydro came up with a figure for the hectares of forest to absorb their CO_2 emissions. I think their figures are suspect. It is probably best to use the forest industry's estimates of cubic metres of wood that can be harvested on a sustained basis. (less than $1m^3$/hec). We should know by now whether this requires 10% of the Province devoted to additional forests (as I suspect) or whether it requires some impossible proportion.

One major source of CO_2 emissions is the burning of slash. This could be eliminated by chipping the slash and using it as mulch to protect new growth and to restore soil nutrients. (I think this should also apply to so-called controlled burns in Parks) Even if it were necessary to pay the industry to change, it would be cheaper than achieving an equivalent reduction elsewhere. Your study states that it "does not include emissions from wood". This is ridiculous! Surely this was forced on your group by another Department. If our salvation is in harvesting more trees to capture the carbon, then the forest industry will gain from the need of the Province to grow vast new forests and they should be willing to cease burning slash.

If, as I suspect, this plan requires active forestry of some 25,000 hectares of new forest then the forest industry could double its most ambitious plans.

Agriculture

Many farms are becoming less economic and it should be possible to arrange mutually advantageous terms for farms which will convert permanently to tree forms. It also fits well with the aging of farm owners. Tree farm management will fit well with older farmers and with their urbanized children. The rest of us would all get sufficient joy from a a wider strip of forest along the foothills so that we would be willing to have it subsidized.

Municipal Waste

All municipal waste should be composted rapidly in concrete silos and then separated into soil and clean fill. This should include newspapers and garden wastes. Anything that's converted to soil fixes carbon. It could eventually help with our erosion problems. Recycling uses more trucks and much more road fuel and undoubtedly creates more pollution than it saves. Making new soil should give everyone a nice green feeling.

Balance

Others have spoken of a balanced carbon cycle in which biologic carbon (usually from aspen trees) is the fuel and the CO_2 which it releases is precisely extracted by the next trees grown in the same area. Our reason for being in Alberta is very largely the great wealth implicit in the energy so cheaply available from our fossil fuels. I believe that we can create a balanced carbon cycle with the cheap fossil fuel inserted into the cycle in place of the wood which must then be used in some manner which retards release of CO_2 back into the atmosphere. Thus carbon is captured as soil made from composted paper or as lumber in an amount equal to the carbon released by fossil fuels in the Province. (I am presuming that we can take credit for the carbon in all exported forest and farm products since the CO_2 was extracted in Alberta).

Timing

If the greenhouse effect has already started then we are late starting. Announcement of a plan to become carbon balanced by the year 2005 might forestall federal legislation if it's made before the next federal election. If the trees were planted by 1995 they might be approaching maximum carbon extraction by 2005.

Public Acceptance

The public has heard the expression "lungs of the earth" so often that they now believe that a mature forest extracts carbon from the atmosphere. On balance a mature forest puts as much back as it extracts due to rotting and burning. They must be convinced that we must harvest and that we must do it in the most energy efficient manner (which is almost certainly clearcutting). The public will be more easily convinced, if at the same time we are doubling the forest in the Province and moving much of it closer to the cities.

Again, sorry for implying that your group hadn't studied the carbon emissions. If we're all lucky you may have studied all the other areas which I have mentioned here. If so please forward the studies and disregard my submission. Thanks in advance for any consideration you are able to give this submission.

Yours sincerely,

Hugh Jones

A.Hugh M. Jones P.Eng. F.G.A.C.

xc R.P. Angle - Sectn Head Atmospheric Dispersion
G.A. Capabianco - Coal Association of Canada
A.H. Zimmerman - chmn, Noranda Forest Group

6021 - 5th Street S.E., CALGARY, Alberta T2H 1L5 Tel. (403) 258-1280

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FAX: (403) 259-2178

To: Clean Air.

FAX: 427-2278

Date:

From: TONY & Penny Marshall
Box 25
ALDERSYDE, AB

This is a copy of a presentation which we made to our M.D. Council to appeal a Development Permit for an asphalt plant near our home. We were frustrated to learn that there are no clear regulations which are being enforced with regard to asphalt operations in this province.

Re: Development Application No. 90 6554
Portions NE 6, SE 7, and SW 8 20 28 W4
Continuation of Sand and Gravel
Mining and Washing

Burnco has been a good corporate neighbour over the years. Our children are the 5th generation to live on this farm. For a number of years Burnco has been crushing gravel across the river from our home, yes, there has been noise, yes, it has been dusty, and yes, bothersome but their operation has never posed a serious health concern. However, for the last few years, Burnco has also been leasing this pit to various asphalt plant operators. This has resulted in our quality of life being greatly affected. On numerous occasions (sometimes two or three times per day) our house, a short distance away from the plant, was engulfed in diesel-smelling dark grey smoke. At other times, the house was not engulfed but the smell of these emissions was bad enough to force us to remain inside with the doors and windows sealed. Since these operators only make asphalt during good weather, the exposure to unhealthy air coincides with the time we are out of doors.

While investing for this appeal, we have discovered some large loopholes regarding the regulations affecting the operation of these asphalt plants:

1. Legislation says that asphalt plants are required to have an air emissions test done and the results of this test on file with Alberta Environment before they can obtain an operating permit. However, this air emissions test is not done on a surprise visit by Alberta Environment! Rather it is prearranged by the asphalt company to have a private testing company come on site on a specific day and time. It is hardly a surprise that the plant is operating within regulations on the day of the test.

In addition this air emission test only measures particulate (number of dust particles in 1000lbs of air) and opacity (reading taken where the plume from the smoke stack is thickest, for six minutes to check obscurity of vision). There are no tests for hazardous or toxic emission exposures.

As you may already know, there will be changes to the existing regulations under the Clean Air and Water Act. They are currently being prepared and plan to be introduced in the Spring Session.

2. Because of the temporary nature of the asphalt operations, they are only required to file the above permit. But it is because of this fact that we have concern. There are no other conditions in place. A business licence from the M.D. is not required nor is a development permit. Thus we have found the responsibility for these operations jumps around between Alberta Transportation, Alberta Environment and the M.D.'s engineers for that particular job. So, when the air emissions from the plant are bad, we call Alberta Environment Air Quality. They inturn may

call the plant manager and ask what is happening. He gives some sort of explanation and then Air Quality will call us hack and report that "it's just a start-up problem" or "it's just dust" or "it's just steam" or "it's just the way the wind is blowing" or "it's just temporary, don't worry about it."

In some cases Alberta Environment may actually visit the site. They drive into the pit in a marked vehicle and then make their inquiries. However, after about our fifth call to Alberta Environment, we asked the Air Quality Investigator, David Bensler, to come directly to our home and check the emissions from there. On that day he saw what it was we had been complaining about first hand. However, when he drove out into the field to get a better look at the plume, the plant was quickly brought back into spec and the air cleared after about 5 minutes. After noting this, he came back into our house to speak with us. After about half an hour he looked out our kitchen window and again saw dark grey diesel/asphalt smoke wafting past. The sad thing about this is that Alberta Environment Air Quality only tests for dust particulate.

When fossil fuels are burnt in the production of asphalt, they produce gaseous emissions which have varying levels of impact on the environment. These emissions include: carbon dioxide (CO_2), sulphur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOC's) and methane (CH_4).

These emissions, depending on the concentrations, can lead to acid rain and air pollution - both of which cause damage to lakes, rivers, soils, vegetation and most importantly, can result in serious health problems.

The primary concern in our appeal lies not on the face of the permit application which is before you today - namely, the "continuation of mining and washing sand and gravel" but in that which is not stated - specifically, the production of asphalt in close proximity to several homes.

As is typical of many things, the danger here lies not in that which we know, but in the unknown and unregulated. Looking at this application one can see on the surface a fairly innocent request to operate a gravel pit. What you do not see, however, is an asphalt plant spewing hazardous emissions into the air only a stones throw away from several single family dwellings.

Asphalt is a complex mixture of high molecular weight compounds with more than 25 carbons per molecule. It is the product of the distillation of crude oil.

The main constituents of asphalts are bitumens and varying amounts of sulphur, oxygen, nitrogen and such metals as nickel, iron and vanadium. Some asphalts are formed by the addition such solvents as kerosene which makes them more fluid and easier to handle.

Asphalts, which are generally referred to as BITUMENS, fall into many categories depending on the refining and additions of the various solvents.

The International Agency for Research on Cancer (IARC) has categorized bitumens into 8 classes. The category which concerns us is called straight run or penetration bitumen and is the term applied to the residues obtained from the distillation of asphaltic petroleums and pressure tars and is used primarily for road building.

The Encyclopedia of Occupational Health and Safety states:

> The effects on the tracheobronchial tree and lungs of mice inhaling an aerosol of petroleum asphalt and an other group inhaling smoke from heated petroleum asphalt included congestion, acute bronchitis, pneumonitis, bronchial dilation, some peribronchiolar round cell infiltration, abscess formation, loss of cilia, epithelial atrophy and necrosis.

The article continues:

> It was concluded that these changes were a general phenomenon caused by breathing air polluted with aromatic hydrocarbons....

According to the Government's own WHMIS CLASSIFICATION GUIDELINES section 6.2.6.:

> Exposure to bitumen fumes, aerosol or smoke, has been reported to cause patchy regions of emphysema, bronchial dilation, pneumonitis and severe localized bronchitis....

Section 6.4 of the WHMIS guide states that bitumen...

> ... and others of similar composition have the potential to cause skin cancer in laboratory animals.

This same document gives asphalt a Class D, Division 2B rating - meaning, vert toxic, poisonous and infectious. It concludes with a health hazard communication that...

> ... heating this product will result in the release of potentially hazardous vapours.

(ie:Has)

In terms that we can all understand, the emissions from this plant have the effect of dramatically reducing the air quality in this area. These emissions can affect human health, corrode buildings and machinery, produce eye, nose and throat irritations and in the short term cause coughing, chest pains and other respiratory discomforts. Over the long term the effects can be much more serious and result in damage to lung tissues, contribute to chronic lung diseases and reduce life expectancy. In addition agricultural crops such as wheat and alfalfa are prone to damage when air emission concentrates are elevated - leaves are damaged, growth is reduced and susceptibility to insects and disease increases.

In conclusion, I would like to restate that historically, Burnco has been a good corporate neighbour and that it is more through ignorance than evil intention on their part that this situation has been allowed to exist.

However, I can not state emphatically enough, the serious nature of this problem. The health and well being of at least 14 people, 6 of them children, depend on you not allowing the continued operation of asphalt plants on this site.

The attached letter from Dr. Len Senger, physician, and Mr. Don Tannas, M.L.A. for this area, substantiate this appeal.

I urge you not to allow asphalt production on this property!

Susan E. Nelson
Box 237
Lundbreck, Alta
T0K 1H0
Dec. 18, 1990

Clean Air Strategy for Alberta
Bag One, Mail Room
Main Floor, North Tower, Petroleum Plaza
9945-108 st.
Edmonton, Alberta
T5K 2G6

Dear Madame or Sir,

Last Thursday I attended a Clean Air Strategy session in Pincher Creek. I was unaware of the purpose of the session, and I was disturbed to find that an attempt made by our policy makers to find out from Albertans what we want and expect in the way of a clean air policy should be so poorly attended.I was personally unprepared because my two main sources of information, the local newspaper, and the C.B.C. had not drawn it to my attention. Fortunatly, I am an avid poster reader, so I found out about the session the day before it happened.

Those who made presentations were not unusual, I suppose, in that they were all expressing their personal point of view. Many of the presentors were almost incoherent with emotion, indicating either severe stage fright, or how deeply they feel about the need for a definitive policy dealing with environmental degradation. What was unfortunate, from my point of view, was that those who were urging rapid and drastic measures be taken came off sounding hysterical and ill-informed, while those who urged a go-slow approach sounded reasoned and intelligent. I had to keep reminding myself that both the mayor and the gentleman from Sparwood had a vested interest in wanting no laws or limited laws. The mayor presides over a town that is becoming more and more dependent upon the exploitation of potentially polluting hydrocarbons, while the fellow from Sparwood was unabashedly promoting the coal industry. Sadly, he was the only presentor quoted in the local paper today.

One "fact" that the man from Sparwood kept stressing was that no one is sure exactly how all of the various pollutants we toss into the air is going to affect the world. Does he want the whole world to be in the same mess as Mexico City before he is willing to accept that hydrocarbons in the air are bad? Unlike him, I don't have a direct economic interest in coal, but even if I did, surely I would have the integrity to concede that sometimes what you don't know can hurt you.

I do not recommend a slow and cautious approach in the drafting of a clean air policy, any more than I would accept the advice of a doctor who suggested waiting a few months before doing anything about a lump in my breast to see if it really was cancerous. A doctor who would not take any preventative measures to save the life of his patient would be, at best , stupid, and at worst, criminal. Still, not all breast lumps are cancerous, and biopsies could endanger the life of the patient if she were allergic to the anesthetic, and the health care system is over used, and doctors and nurses are under paid, and , and , and..... But it's my health, damn it, and no excuses about the need to go slow will satisfy me! Yes, I am willing to forego many of the trappings of our modern society if it means our world will survive, just as I would be willing to accept the loss of a breast if it meant saving my life.

The presentors who took a conservative stance on the need for legislation expressed fear that tough laws would hurt the economy. I agree. * I also prefer economic pain to possible ecological death. I believe that the most effective way to end irresponsible use of resources is to make them very expensive. I recall when I could fill my gas tank for $5.00. Everyone drove everywhere. No one worried about wasting energy, and those who complained about exhaust were considered whiners. Then came the oil embargo of 1973. I was in Switzerland that Christmas. For the first time in my life I saw people making a concerted effort to not waste. No private vehicles were allowed on the road on Sundays. No store would give you a plastic bag, without a lot of pleading. A little old lady rapped on the car window one day and gave me a lecture because the car had been left running while the driver ran into the post office to mail a letter. No one complained. Everyone accepted these measures because they believed that if they didn't conserve they might literally freeze in the dark before winter's end. Less air pollution was a side effect of the conservation, and the conservation was encouraged by the extremely high price of gasoline and oil, as well as other petroleum by products. It was very much like a war situation where rationing was used. Back home there was a war too, but mainly at the gas stations in the States, where motorists often got violent if they thought the station would run out of gas before they got to the front of the line. Prices had risen, yes, but not enough to impress most people that we were in a crisis that demanded teamwork.

Some research was begun in those oil crisis days into finding alternate energy sources. Some alternate energies had the added attraction of being less polluting than our non-renewable sources. Some of us got very excited about solar power, and wind power, and hydrogen. Then the crisis seemed to peter out and even those of us who would have liked to rely on the new, clean energy, found that we simply could not afford the capital outlay it would take to be properly set up. So, we stayed with the electric power supplied by hydro and coal. We stayed with propane, or switched to natural gas. We made some concessions to the higher prices, by better insulating our houses, buying smaller cars, not leaving the Christmas lights on all night. A new generation has grown up with the higher prices, and accept them as the norm. They don't understand why Dad freaks when the t.v. is left on when no one is watching. They think that anyone who doesn't have at least two long, hot showers a day is deprived and possibly unhinged. They are even more attached to their cars than I was to mine twenty years ago. The only time they don't drive is when someone else offers them a ride. I went to university with young people who refused to use the public tranportation because it was uncool. The only way people with that kind of attitude will accept the need to cut back on the use of polluting, energy wasting luxuries, is to **make them luxuries**. Make energy too expensive to waste. Reserve cheap fuel for people who need it to make their living. Charge a surtax on Sunday driving. Make car pooling and public transport so cheap parents will force their children to use these methods. Don't allow anyone to park on the university grounds unless there are atleast two people in the vehicle. Subsidize alternate energy sources so that ordinary people can consider building solar heated houses, or creating their own electricity.

We are still hooked on cheap, accessible energy, and just like the cheap, fatty junk food many people are hooked on, it is at least going to make us unhealthy, and it may even kill us. As with any addiction, quitting is not easy. As with any addiction, we're not sure where it will lead. As with any addiction, there are three possible ways of quitting: We can keep using at the same or even faster rate until its all gone and we have to go "cold turkey"; we can try to taper off, and get the situation under control; we can meet the usual end for junkies, overdose and die.

I believe that the only sane clean air strategy is one that can be implemented in the shortest time, with the widest effect. No one can not do their part. This is a war, and those who don't take part are traitors to all of human kind.

Sincerely

C. Tice

- A clean air strategy for Alberta has to consider this issue. It was ignored in the ALPAC EIA Review, but cannot be ignored any longer. Ralph Klein says that Alberta's emissions standards are the highest in Canada. The Hinton pulp mill is living proof that these standards are not good enough. - J.R.

11 September 1989

Mr. G.J. DeSorcy
Chairman, ALPAC EIA Review Board
15 Floor, Standard Life Building
10405 Jasper Avenue
Edmonton, Alberta
T5J 3N4

Re: ALPAC EIA Review - Terms of Reference, Air Quality

Dear Mr. DeSorcy:

The terms of reference for the review of pulp mills in northern Alberta contains several important mandates to examine the effects of proposed pulp mill development on water quality. However, in the copy I received from the Hon. Ralph Klein, there is no mention of a mandate to examine and report on the effects the proposed pulp mills will have on AIR QUALITY.

Since some existing pulp mills in Canada have caused serious health problems due to air pollution, Albertans are naturally concerned about the effects that the proposed pulp mills in northern Alberta will have on air quality. Emissions into the atmosphere are not confined to any particular area and have the potential to affect a wider area and a larger number of people than water-borne pollutants. A comparison of total potential air-borne emissions from the proposed plants vs. existing plants that have caused health problems is required.

We request that you expand the terms of reference of the ALPAC EIA Review Board to include a complete examination of the potential effects on air quality in Alberta.

Yours sincerely,

Jim Rennie

Jim Rennie

cc/Hon. Ralph Klein
Minister of Environment
130 Legislature Building
Edmonton, Alberta T5K 2B6

jrl.02

July 12, 1989

Hon. Ralph Klein
Minister, Alberta Environment
130 Legislature Building
Edmonton, Alberta
T5K 2B6

Dear Sir:

Re: Pulp Mills in Northern Alberta -
Public Participation in Decision Making

The recent announcement of plans to build several pulp and paper mills in northern Alberta raises some very real concerns about public health vs. economic benefit.

During the process of developing E.I.S. plans, various experts will no doubt quote figures as being "acceptable" or "safe" limits for the release of waste by-products into the rivers and the atmosphere. In fact, the "safe" limits on some of these substances has not yet been adequately demonstrated, especially for highly toxic dioxins. The Alberta government should not be relying on industry to provide Environmental Impact Assessments, nor should it rely totally on "expert" opinion on what is a "safe" level of contamination to develop provincial standards.

Instead, Alberta Environment should be conducting its own independent comparative studies. Comparative studies should include comparison of the total expected released quantities of dioxins, SO_2 and other contaminants from the new plants with the released quantities that have caused health or environmental problems in other areas.

For example, the population of Port Alberni, B.C. has experienced serious lung disorders on a rate that is 12 times the national average, and the problem has been directly linked to atmospheric emissions from the Alberni pulp mill. Granted, the Alberni mill employs outdated technology, and the proposed mills in Alberta will have a more efficient process in terms of percent of contaminants recovered, but these proposed new mills will be producing larger quantities of pulp. How do these proposed new pulp mills compare in total emissions to the atmosphere with Port Alberni? How do they compare with Prince George, where health problems have also been reported?

As another example, how would total quantities of dioxins released from the proposed new pulp mills compare with the existing Grande Prairie mill? The Grande Prairie mill, as you are aware, caused significant dioxin levels in fish in the Wapiti River. The dioxins involved are the types known to be highly carcinogenic. The Grande Prairie mill is obviously hazardous to public health, and we should not build any more pulp mills that run the risk of repeating these dioxin releases. An improvement in the process for the proposed mills can easily be offset by the fact that the new proposed mills will be larger. A comparison of total quantities released to the water and atmosphere is required.

Considering the uncertainties involved in setting up meaningful provincial standards, one has to ask why it is necessary to licence all these new pulp mills at once. The Alberta government would be well advised to consider conditional approval, under the strictest regulations, of only one project using state-of-the-art technology and monitor that project carefully for several years before approving any more. The licence for this first mill should be conditional, i.e. if it doesn't meet strict standards, the licence is revoked. The responsibility should be put on the pulp and paper industry to demonstrate that it can build a pulp mill without serious environmental impact. To date it has not been able to accomplish this. If this more cautious "show-me" approach is not acceptable to the pulp and paper industry, then Alberta would be justified in questioning the industry's motives and integrity and in refusing to licence any new pulp mills. What could be more fair?

Since public health is at stake, we, the undersigned, request that Alberta Environment carry out independent comparative studies and hold frequent hearings with the public on this issue, and be prepared to accept public input. These meetings should not be limited to just the northern communities near the proposed pulp mills but should also include major population centres such as Edmonton, Red Deer and Calgary. Alberta is well past the stage where we have to accept risk to public health for the benefit of a few jobs.

Yours sincerely,

Jim Rennie

J. Rennie
4308 - 41 Avenue S.W.
Calgary, Alberta
T3E 1G4

cc: Premier Getty
Hon. L. Fjordbotten

Dale Desjardins

Gene Frison

Niki Schmidt

Dave Washenfelder

Dave Washenfelder

Terri Foster

Terri Foster

Dave Lovatt

Richard Thompson

A Submission to the Clean Air Strategy for Alberta

Craig Schneider

11335-111 ave

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100% Recycled Paper

<<Humans are the victims of their own self importance, conceiving themselves to be at the centre of the world, surrounded by a vague environment. This mistaken inside-out world view has shaped and directed traditional religion, philosophy, science, and art. Hence the race's heavy thinkers have recognized as important only two relationships - man to man, and man to God. The planet-people union has been unsensed and unknown, excluded from serious thought.

The new reality, glimpsed from outer space, shows a marvellous global ecosystem - the Ecosphere - in which people are enveloped as one vital part among many. This is the outside-in panorama.>> [1]

A Brief Overview of the Problem

This panel has been mandated to look at energy production related emissions to the atmosphere in Alberta. Opinions were solicited on emissions causing climatic warming and smog. The most important greenhouse gas in Alberta is carbon dioxide. The effects of methane and CFCs also contribute but are not considered here because the energy industry is known not to be a big producer of these gases [2]. The components of smog are generally oxides of nitrogen (NOx) and sulphur (SOx) which, when combined with sunlight, produce ozone. NOx is directly related to emission of CO2 through combustion of fossil fuels, therefor any discussion of CO2 reduction will have the same effect on NOx emissions.

The release of sulphur oxides has been researched intensively in light of the acid rain problems experienced in eastern North America. It has been discovered that:

> "... it is extremely unlikely that, except in the immediate vicinity of point sources, there is any impact on any of these [crops, soils, surface waters] environmental components" [3]. The same study also

concluded that the ozone concentrations that were being recorded were the result of long range transport from the northwest U.S. [3], and are thus not treated in this representation.

Given that the main culprit in the production of smog is NOx and that NOx sources are also CO2 sources I have chosen to deal only with the issue of CO2 emissions in Alberta.

Why worry about Carbon Dioxide?

It can be said that the only reason to fear CO2 in the atmosphere is the threat of global warming. Global climatic warming has not been conclusively proven to be the result of the greenhouse effect. This is largely due to a certain natural variability in the global climate. What has been proven is the ability of certain gases to trap infra-red radiation. It has also been proven that global temperatures have increased by approximately 0.6 degs C in the past century [4]. Finally we have proof that the composition of the atmosphere has also changed over this same period. "CO2 is up 25%, NO2 is up 19%, and CH4 by 100%" [4].

While we do not have the direct evidence that seems to be required to motivate people, there is at least as much evidence of the greenhouse effect as there is that acid rain is caused by gaseous sulphur emissions or that smoking causes cancer. The only other reason to hesitate is to question what harm a little warming will cause.

Why Worry About Climatic Change?

According to a 1989 study commissioned by various departments of the Alberta government, the climate of the province would become similar to that of present day Colorado if the current projections become reality [5]. This conclusion was arrived at using the best available prediction technique; the Global Climatic Model (GCM). The ability of GCM's to model climate change has been questioned but even if we accept its validity we must also wonder whether it is such a bad thing that Alberta's climate should become more moderate. The more difficult aspect of climate to predict is that of variability. The same study concluded that climatic variability would increase and the result would be more frequent periods of extreme or even damaging weather. They outlined our need to understand these potential changes so that if nothing could be done to mitigate them, then at least we could help prepare for them.

Towards an Industrial Ecosystem

One of the difficulties of reducing our output of greenhouse gases has always been that it was assumed that all the reduction would be realised by reducing consumption. While reduced consumption of fossil fuels is inevitable, it is possible that through the more efficient use of these fuels we will be able to produce more end product per unit of energy and thus be able to develop new and affordable industries.

The idea is to look at industry the same way we view ecology. We must consider the inter-relationship of all the products, materials and energy consumed in the industries of a given area. To carry the idea further we can then look at all the end products - both waste and useable - and determine how they will integrate into the existing biological ecosystem.

Today, when an amount of coal or gasoline is consumed, its energy is used to perform a given task, and its waste products - CO2, NOx, SOx, and heat - are dumped into the atmosphere. If these so called waste products were used in other processes, then the increased production would bring in greater returns on the amount of energy used, and on the amount of pollution created [6].

This approach can be applied even at the smallest scale. For example, it has long been known that incandescent lightbulbs are more efficient at converting electricity into heat than into light. Yet we continue to use incandescent in situations where we have no use for the heat they produce, and where a more efficient fluorescent bulb could be used.

Any future programs or legislation should be constructed in such a way that they encourage the development of industrial eco-systems. The first step could be for industry to submit inventories of the inputs and oututs of their factories. These inventories would be available for all to inspect, and other industries would be encouraged to use their waste products. A possible second step would be to introduce some type of pollution tax (or carbon tax) that would help make it more economical for companies to find uses for their waste than dump it.

Practical Example of an Industrial Eco-system

In March of 1990 the media reported on an entrepreneur who was trying to market an idea for co-generation of electricity in Alberta. This man had developed a small electric generator that could run off of the gas flares that are often associated with oil wells in southern Alberta.

These flares are used to dispose of the small quantities of methane that are associated with oil wells. The amount of gas is so small that it is not economically feasible to trap it and transport it to market. It is however much cheaper to transport electricity so the generators can make the power almost affordable.

The problem is that it is still cheaper to burn the gas and then buy our electricity from a coal fired electrical plant. It is obvious that this is a waste of a natural resource. The difficulty lies in figuring out how to resolve the situation. Industry claims that the royalty structure encourages them to flare their waste gas. At present the provincial position can be summed up in the following quote; "If the waste gas is to have a value to the company, then a portion of that value must be paid to the province as a royalty" [7]. Industry would argue that it makes sense for the royalty to be waived in cases where it prevents the waste gas from being put to some practical use, but that ignores the underlying cause of this situation. Royalties are charged on all other resources, so why do they become a roadblock in this case? The reason that free dumping of waste has become an institutionalized policy. People fail to see why someone should be charged for dumping CO2, NOx and other toxic substances into the air. If the owners of the well lease were being charged a fee for the privilege of disposing of their waste in our breathing air, then it would suddenly be more economical to get every last bit of energy out of it before it was dumped.

Another angle to this story should also be considered. Why is it so inexpensive to make electricity from coal? It is mainly because coal is plentiful and relatively cheap. One of the reasons it is cheap is because its use is more harmful than other sources of energy and therefor it tends to be used as a last resort. If there were a carbon tax it would be made more expensive, due to its higher rate of CO2 per unit of energy produced [8].

If the concept of industrial eco-systems was adopted then the resource royalty and utility rate structure of the province would need to be adjusted in order to reflect the present day realities of an atmosphere which can no longer support industrial waste disposal.

The Armageddon View

There are many who would have us believe that because we are reliant on the production of fossil fuels to bring in royalties, we will lose the most when we try to reduce our CO2 emmissions by 20%. We potentially stand to lose the most because we are the largest per capita emittors of CO2 in Canada. I contend that if we plan ahead and get to the forefront of the inevitable wordwide revolution in energy production, then we will come out ahead. All one has to do is look at how Japan benefited from the last energy crises. Japan is a country whos industry is heavily dependent on imported fossil fuels, yet when the price for their fuels rose dramatically during the early seventies, they developped products that were more energy efficient and were thus in greater demand and in the end came out ahead.

It brings to mind the anecdote about how when fuel consumption standards were introduced in the U.S., the North American auto industry hired 500 lawers to fight the legislation, while the Japanese hired 500 engineers; we have been struggling to catch up ever since. I think that it is time we quit fighting every environmental change in the courts and start fighting it in the factories and laboratories.

In order to avoid the comming industrial Armageddon, Alberta should stop viewing itself as a producer of fossil fuels and become a producer of energy. While the threat of climatic warming may force a global reduction in the use of fossil fuels, and of energy in general, there will be a huge demand for alternate sources of energy. This demand for new technologies could be met by Alberta if we get into this field now. It has always been a priority of the Alberta government to diversify the economy. I'm not sure that we need to diversify into other industrial sectors, it may be enough to diversify within the energy industry.

Conclusions and Goals

The discussion on the effects of the greenhouse affect will continue long after it becomes apparent that the climate is indeed warming. One only needs to look at the history of the acid rain problem to be sure of this. It is a fact that we have changed the chemical composition of our atmosphere. The radiation trapping properties of some of these gases are known. Given that the effects of this warming are widely debated, and that the past history of humans changing the environment have been largely negative, there is a need to act now to reduce our outputs of CO2, NOx, SOx, and O3.

Because the most painless way of achieving large reductions in CO2 output (and at the same time in NOx and SOx) is through improved efficiency in the energy and transportation sectors; because Alberta is one of the largest producers of these emissions in the country; and because we will be strongly affected by reductions in consumption of fossil fuels by our customers, we should take the lead in developing efficient industries and alternate forms of energy. This leadership will enable us to maintain the standard of living of our people during a time when our primary resources are becoming less valuable.

As goals we should set out the development of industrial eco-systems through the incentive of full cost pricing on waste disposal. We should encourage the development of alternative methods of electrical generation. As a short term goal we should market our natural gas as a cleaner fossil fuel both within Alberta and outside. The most pressing need is to educate Albertans to think of this as an opportunity rather than as a disaster, and to lead the way in altering our industry and transportation systems.

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November 28, 1990 Doug Shepherd - Medicine Hat

Presentation to Clean Air Strategy for Alberta

Ho Hum.

Here we are in the boondocks again to listen to the prattle of yet another fool.

It is too bad that we politicians have to go to the expense of listening to the prattle when we wont understand and will do what we intended to do in the first place.

At least our form of good government gives the feeling to all that they were heard. That's great politics. The idots are too stupid to know that they have been had. If we had true party politiucs then those who did not pay would be kept out of this meeting.

Look at the success of the Oldman Damn. Lethbridge needed extra water to supplement the 25 cubic feet per second that occurs during cold winters. We now have that plus the water to irrigate rough land where the heat units are low and oats and forage are the preferred crops because of the short growing season. We have the natives upset. We have confrontation with the federal government which always gets votes. if we really look like idiots to the remainder of Canadians then we can claim that we were misquoted. The project was a success because Quebec had to get out the army to handle the problems created by their insensitivity. Our educational system is being downgraded to meet our personal standards so given time we will regain respect. All is not lost because we have asked Quebec to help us and they have most of our $100 billion removed by the NEP and they will spend it here to make us look good.

The basis for a clean air strategy seems to be that "Energy" is the enemy and those that use it are also. Cattle produce methane as do people and now we hear that beef cattle are the enemy also. We have known for a long time that people are in the way of this government.

My first question seems to be that in this age of manipulation by unknowledgeable politicians how many dollars have been wasted thus far? People no longer matter for they have been harnessed as a crop of taxpayers.

How many uneducated emotional fringe groups have been attracted because of inaccurate incomplete information and how many truly competent experienced people will observe in horror this latest government farce.

Nuclear Power had the potential of being the non polluting panacea for the future.

Let us thank God that the politicians have successfully performed their black art and demonstrated that without doubt there must never be another nuclear plant built and that hopefully we can successfully dismantle and clean up what is already in existence. We have seen a generation of incompetence, confusion, duplicity, dishonesty, patronage, etc. You can add more adjectives which the politicians have taught us to associate with them and their entourage and the failure of a power source that could have assured cleaner air.

For the purpose of this meeting, we are discussing Applied Thermodynamics, that branch of physics which treats of various phenomena of energy, and especially of the laws which govern transformations of energy. Thermodynamics has ramifications which extend into the fields of chemistry, electricity and astronomy. We must know how to successfully, economically and efficiently work with the phenomena which convert energy to heat which is in turn transformed into power and work and by appropriate processes of heat transfer and further transformation, refrigeration or a cooling effect by which a cooling effect may be obtained.

This science is not easily understood and is not aided by the contemporary political process.

Example # 1

The great energy crisis of 1972 was not an energy crisis for there was no shortage of energy. There was a shortage of money to buy energy because of a political philosophy. OPEC struck and the race by politicians to create confusion shifted into high gear.

The more serious crisis of the time was the protein shortage which has immense ramifications. Of great interest is the project which was to have soybeans (an excellent protein source) grown in Alberta but this project is on the back burner until panic time. Back to hydrocarbons for fuel.

A gasoline engine operates on the Otto cycle. This cycle is more efficient if the compression ratio of the engine is increased. Our politicians introduced legislation to decrease the compression ratio of the engine (decrease efficiency) which caused increased consumption of fuel per distance travelled. More heat was rejected per unit of distance travelled. Yes we have successfully used our brilliance to directly add to global warming. Our politicians have not been eating Brocoli! They say it makes you smart!

Yes you say, but cars now travel further on the same amount of fuel. Of course they can. The cars are smaller, lighter, more complex, suffer greater damage in accidents, have engines which rotate at higher speeds and wear more quickly etc. This is political progress.

Otto cycle automobile engines are not efficient. Electrical generation of power is more efficient. Immense amounts of power are generated at thermal generating stations but are we extracting all the energy that we can? Attractive alternate non polluting travel by electrically powered trains has not been introduced. Trains are being abandoned. We are blamed for not using the trains so we lost the service. Just who but a politician has the mentality to expect people to sit and wait hours of days for a train to arrive?

Small high speed engines are less efficient than large slow moving engines so with great logic, diesel engines are undersized and over injected causing black smoke from unburned fuel.

What happened to the electrically driven trolley bus?

To compensate for the problem of the overinjected compression ignition engine, the so called diesel engine, Jake Epp the federal Minister of Energy came to Medicine Hat and announced a program costing millions of dollars to replace diesel fuel with methanol. Dollars and taxpayers we have. Common sense we dont need for we are the government.

Natural gas has a higher heating value of 23,650 Btu.per lb. of fuel. Methanol has a higher heating value of 9,600 Btu. per lb. You can look at the 14,000 Btu per lb. dissappear as vapour on a daily basis from the methanol plant. The process leaves low quality energy which adds to the global warming in the form of water vapour as low grade heat but is in not smarter to use this energy than to waste it on global warming with nothing in between?

We know now that dinosaurs lived for about 60 million years on earth. These creatures had a small brain. I have it on good religious authority that the date is year 5751 In this short period of time man has indeed made an impact. Party politics has been around for about 200 years so our march to extinction perhaps should be measured with that yardstick. If you join the party then you can achieve full citizenship without education experience or ambition. If on the otherhand you educate yourself, work and gain wide experience then you sit on the sidelines and observe the new society and the parasites who qualify for work because of the payment of a fee to join the self annointing fools who now spend 60% of the Gross National Product and are being successful only in driving the country into third world status.

We Canadians live in an environment which is often hostile. We are great consumers of energy much of it by necessity more of it by sheer ignorance. What we have observed as the imposed lifestyle in the New Canada is an attempt to harness the taxpayers to serve ignorance in perpetuity. To add to tax revenues by finding excuses to tax fuel serves to improve the ego trip of the politician and entourage. It is not an attack on pollution.

Architects seem to design using odd shapes which are classic designs for heat loss. We see building materials used which transmit a great deal of heat. Look around this city or any city. Our government uses architects to perform engineering projects and we simply look in horror at the waste of energy so we surge toward third world status with pleasing visual impact.

Our puny and limited human capability has produced much but there are limitations because of materials available to accomplish what we must in efficient energy usage. One of the great limitations is the failur to produce and use materials and processes which use heat at high temperatures.

We hire consultants who use yesterday's technology and mentality but today's politics to to us recommend that massive quantities of energy for years be wasted. We have developed a system where red tape, petty power struggles, juridistional infringement, slothfulness, ignorance, self image enhancement,tradition, fear, self comfort and a host of modern sophistications to life have eliminated progress in Alberta. How many Albertans have left the province never to return because of closed doors and ignorance fostered in Alberta by those who with limited education and experience have dug themselves in for the duration. We live with the brutal reminder that management science as we know it today evolved about 1900 and for the first 50 years, the major management researchers were ignored and now we look to Japan to bring to us what our management researchers discovered in the nineteen twenties.

Those whom we defeated during the second world war and later have had their counties devastated by war are now sought after to loan us money and to bring us technology because our politicians are destroying the nation through sheer parochial ignorance.

We appoint Energy Resource Conservation Boards and the appointees listen to submissions. I attended a presentation hoping to hear a discussion of efficient use of energy and came away a day and a half later after hearing hearing of jurisdictional, rates, and other problems, not energy. Later a decision was issued on the Medicine Hat power plant which has the possibility of becoming the most energy efficient plant in Alberta with the least pollution and the desicion was to favour the less efficient plants that pollute.

To me the whole process is incredible that we politely tolerate an attack on intelligence by our politicians and their appointees. When can we expect a housecleaning and move into the 20th century? It is nine hears plus one month before the twenty first century.

We write letters to participate in the increase in the use of renewable energy and the letters are not answered by the civil servants.

We observe Marcel Masse, the federal Minister of Quebec Patronage fly to Medicine Hat to take credit for the waste of money for Methanol powered busses. The cost of a trip is reported to be $18,000 and what is the amount of fuel consumed on operation stupidity for his morning of basking in his own stupidity?

Is it smart to use natural gas to boil water? Not really. The temperature within the flame is over 3000 degrees Fahrenheit and the water boils at 208 degrees. Part of the implication of the second law of thermodynamics is the Law of Degredation of Energy. Simply put, energy must be used at the highest possible temperature to avoid waste. processes must be used so that there is a minimum temperature loss during each process. When do we accept the common sense of the situation and start to use the people with the education and experience rather than the friends of the politicians who have paid the final fee to achieve full citizenship?

To use the heat from Natural Gas to drive a gas turbine is contrary to the pontification of an Alberta Premier. The waste heat from this gas turbine generating electricity is at high enough temperature that a modern steam turbine with steam at dull red heat temperature will drive an efficient regenerative reheat turbine with steam bled off in appropriate quantities as the economy and thermodynamic requirements of the situation dictates. As the heat lowers in temperature then residual processes must be found to complete the obligation of our efficient use of energy and thus less pollution. When do our economic studies include social needs?

I have read the glossy brochures issued by this group and inquired as to who will finally absorb the information and make legislation. This project has the possibility of making the Oldman Dam project live as a memory of exquisite social, environmental and technical excellence.

Since my return to Alberta 16 years ago I have written and presented many briefs. I have spent thousands of hours studying, reviewing and adding more information. I have proofread and reread and consulted and have had audiences come from afar in the hope that I will be able to make an impact where they have failed but what we Albertans face is a closed minded monolithic monster which is unable to act and progress as others do.

The contempt for the citizens of Alberta which is plainly expressed by the politicians, their absymal display of lack of education and experience, their quaint parochial views, bunker mentality and hiding the facts has led us to a point of no hope of progress in the future.

The offer of money to corporations from outside Alberta to maintain industry here, the denial of the same opportunities to those who will eventually leave because on no opportunity to participate in life in Alberta makes the choice of a foreign culture or country a preferred alternative to participating in the degeneration of society by paying taxzes to support incompetence.

We have observed the knee jerk reaction to pressure groups to gain votes only to see this result in the long term abuse of the citizens of Alberta and damage to investors who at one time had confidence in our government.

We have now groups of civil servants holding a public meeting so that their bosses can ask the question " How can you have such negative thoughts about a bunch of nice guys like us?"

My god when will politicians learn how badly they are screwing up everything they touch?

CLEAN AIR STRATEGY FOR ALBERTA

Submission by Dave Sheppard, Box 102, Pincher Creek. Nov 26,1990

As a concerned citizen I wish to make the following points:

1) Energy Conservation.

The single most effective thing Alberta can do to alleviate global warming is to institute a comprehensive energy conservation program. Have we a program in place at the moment? If we do, few people know about it, and even fewer follow it.Governments must lead the way in energy conservation by setting an example, and this example must be well publicized. As a whole, present energy conservation programs do not seem to be effective. Why is this?

2) Alternate Energy.

Any fossil fuel consumption that can be replaced by alternate energy sources is a gain for air quality. Alberta does offer some support for the development of alternate energy, but needs to do much more.

3) Energy Efficiency.

Can government set energy efficiency standards for various industries? for appliances? for vehicles? Can government offer incentives and awards for energy efficiency? Can government motivate manufacturers to reduce packaging?

4) Air Quality Standards.

If Calgary air, for example, is rated clean by existing Provincial air quality standards, then the standards and controls are inadequate because Calgary air is often very foul and unfit for human consumption.

5) The Forest Industry and Global Warming.

The forest industry contributes substantially to global warming through:

a) the burning of slash, mill waste, and forest fires;

b) the removal of forest cover on a large scale and the subsequent release of stored CO_2 to the atmosphere;

c) the removal of trees which absorb atmospheric CO_2;

d) the scarification and disturbance of forest soils which "burns" humus rapidly, thereby releasing more stored CO_2.

There are very few days any more when our beautiful mountains standout sharply and clearly. Most of the smoke in the Pincher Creek area comes from forestry operations in B.C. and the United States, a transboundary problem. Solutions?

a) less logging.
b) greater use of selective logging.
c) reduction of waste.
d) banning the burning of slash and mill waste; replacing it with chipping, or scattering of slash.
e) banning scarification.

6) Volatile Organic Compounds (VOCs)

I find it hard to believe that the spraying of pesticides is not a major contributor of VOCs in Alberta. It is not mentioned in your handout.

7) Sulfur Gases

More needs to be done in controlling sulfur releases from oilsands plants, oil refineries, gas processing plants, coal-fired generating plants, and other sour gas and oil facilities and processes such as wells, welltesting, compressors, pipeline cleanout, etc.

There has been much improvement in recent years but more can and should be done. As the second leading source of SO_2 emissions in Canada, Alberta may be contributing to the acidification of susceptible lakes in other provinces and territories downwind.

Relative to population, Alberta is an excessive contributor to global air quality problems, and these problems are very serious and perhaps even life-threatening. We owe it to our children and grandchildren to do all we can to reduce our contributions to global air pollution, even at the risk of reducing short-term economic growth, or sacrificing that third car in the driveway. Clean air is not just a matter of simple-minded economics; it is also a matter of survival. Which is more important?

Thanks for considering my submission.

LIGHTING POWER CONSERVATION IN OFFICES AND CLASSROOMS

F. Stovke
Energy Consultant
Edmonton Public School Board
One Kingsway
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ABSTRACT

Very little seems to be known about optimum lighting conditions for classrooms and offices. For this reason a large savings potential in the area of lighting power is often neglected. The lighting designer tends to consult the local building code. In Alberta the building code happens to call for 800 lux*) for classrooms. Alberta Education, however, recommends 500 lux, and an environmentally conscious country like Sweden decrees 200 lux as sufficient.

Starting out from these wildly differing recommendations, this paper will try to shed some light on the biological findings that will help to select the proper lighting level and provide some technical information on choosing economical solutions to achieve low power consumption. At Edmonton Public Schools, reductions of lighting power consumption tended to be around 30 - 50% in classrooms and offices.

An information campaign that makes users aware of the benefits of lower lighting levels is the most important step prior to delamping or other reduction of lighting levels.

1. NEED FOR A REVISION OF THE BUILDING CODE WITH RESPECT TO LIGHTING LEVELS

Lighting level recommendations have undergone dramatic changes over the last fifty years. The Illumination Engineering Society's (IES) lighting handbook that so far has been considered the basic reference, over the years has received considerable input from the lighting and power industries (1).

A good example for these rising lighting standards are those for schools in the New York City Public School System. Illumination levels recommended for classrooms were increased from 20 foot candles (fc) in 1952 to 60 fc in 1971; while 20 fc lighting levels were deemed sufficient for libraries in 1952, 70 fc were called for only 20 years later (2).

Could the eyesight of the nation have deteriorated so much in so short a time? As a matter of fact great effort was expended in proving a relationship between levels of illumination and the efficiency of performance of visual tasks. This research came out in 1959 as the Blackwell Report (3). The findings of this report are the basis for today's high illumination standards.

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*) 1 foot candle (fc) = approximately 10 lux.

Blackwell devised experiments to measure visual performance for both static and dynamic tasks and a device called a "visual task evaluator." Appel and MacKenzie produced a critique of Blackwell's work that culminates in the question if a 4% increase in the accuracy of performance of artificially designed laboratory visual tasks is worth a doubling or tripling of foot candle requirements (4).

After 25 years of research into lighting requirements for reading, Tinker made the following statements cited by Dumas in "The Conservation Response": " ...visual acuity increases rapidly as light intensity is increased from a fraction of a fc to 5 fc and then gradually up to between 25-40 fc. As the illumination intensity is further increased up to 100 fc or even above 1,000 fc, the improvements in acuity are slight. Although the gains in acuity with itensities above 50 fc may have theoretical implications they have no practical significance for reading (emphasis added)." Tinker further concludes: "Gains in acuity when illumination intensity is doubled, are very slight for levels above about 20 fc. It is questionable whether the almost microscopic gains in visual acuity obtained under the relatively high fc of light justify their application to visual tasks such as reading..." (5). Figure 1 has been designed using the above description. Lloyd Dumas is of the opinion that excessively high levels of illumination will reduce the efficiency of performance of prolonged visual tasks, despite the slight gains in visual acuity they produce, by increasing eye fatigue.

Lloyd Dumas concludes: "...it seems clear that illumination intensities in excess of 20 to 50 fc are simply not justified by any significant gains in the performance efficiency of reading or other similar visual task."

At Edmonton Public Schools I found school offices that had been delamped by secretaries from about 100 fc to half that level or less in order to eliminate headaches that bothered them under a

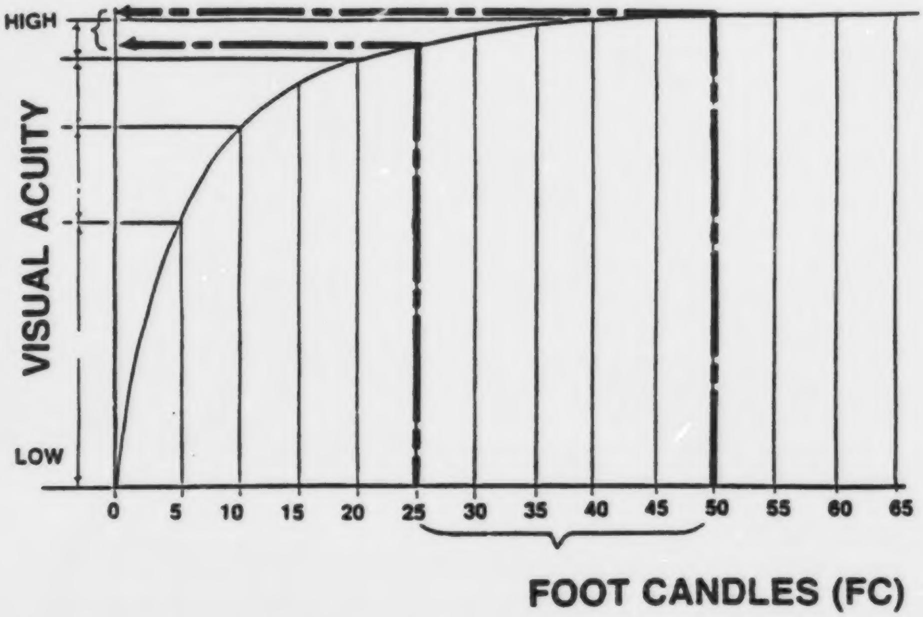

Figure 1. APPROXIMATE EFFECT OF DOUBLED LIGHTING INTENSITY VS. INCREASE OF VISUAL ACUITY

lighting level considered optimal by IES and Blackwell. A colleague of mine, Peggy Evans, Assistant Principal at Brander Gardens School, made the following remarks (6) about an experiment she conducted in one of her classes: "In one classroom where I reduced lighting levels to approximately 45 fc, I found my students enjoyed the change to such a degree that they pressured me to reduce it even further. A summary of their comments indicated that this environment was friendlier and not as harsh. They found it easier to concentrate. Those wearing eyeglasses appreciated the reduction in glare and thus experienced less eye strain."

Other teachers at Edmonton Public Schools reported that turning some lights off in a classroom was an effective means of calming students down.

Peggy Evans also cited research by Drs. Ken and Rita Dunn "that reported brightly lit classrooms made some children fidgety and nervous. These students also displayed symptoms associated with various degrees of hyperactivity. The Dunn's also recognized that others found the brightly-lit room invigorating. These children became lethargic in a dimmer environment. [They did well under lighting levels of 85 fc.] Other students displayed no preference whatsoever for either lighting condition.

Drs. Dunn also found that poor readers tend to perform better in dimly-lit environments. Good readers were found to be equally right and left brain learners, but 82% of poor readers were found to be right-preferenced.

Right-preferenced learners were found to prefer low lighting. What Dunn and Dunn concluded was that some children are strongly affected by the lighting level in their learning setting and that this can be a key factor in their achievement. What this suggests to me is that the lighting levels in class, especially those catering to special needs children, should be re-examined."

Everyone is aware that the pupil of the eye closes more and more as the lighting level increases. The strain on the eye muscle to keep the pupil closed to a small aperture would explain the headaches developed by some people after prolonged exposure to high lighting levels. John Ott (7) reports of an experiment with two contact lenses, one of which was ultraviolet transmitting, the other not. When applied to the eyes of a test person under artificial lighting without a UV component, both pupils were of the same diameter. In daylight, however, the pupil with the UV- transmitting lense closed more than the other one. This indicates two things:

1. Our eyes are capable of recognizing the non-visible ultraviolet light.
2. The cool white fluorescent light would appear brighter than the identical level of daylight.

Tinker's research shows that people will develop a preference for a lighting level to which they have adapted. In one case he allowed a group of subjects to adapt for 15 minutes to diffused light producing 8 fc of illumination. He then varied the light intensity and asked the subjects to choose which level of illumination they found preferable for reading. Most chose 8 fc. He repeated the experiment allowing 15 minutes of adaptation to a level of 52 fc. Now the subjects most often chose 52 fc. From this Tinker concludes: "Apparently, by picking an intensity and adapting the reader to it, one can obtain a preference for that intensity. If the investigator is interested in promoting use of lights of high intensity, the method of preference will support it."

Further, Tinker found that after a period of adaptation to levels between 3.1 fc and 53.3 fc, the speed of reading was the same.

Dumas (9) states: "One of the reasons why the Blackwell experiments are misleading is that they deal with completely unpatterned tasks, whereas the vast majority of real world tasks involve some degree of patterning. They are therefore far more relevant to the setting of illumination levels for tasks like gauge reading and finely detailed industrial visual inspection than for reading, writing, etc."

Obviously such intricate tasks would best be performed under task lighting without flooding the whole room with blinding light.

An investigation at the George Washington University and the Childrens' Hospital National Medical Centre in Washington, D.C., concluded that severe damage of the eyes, leading in some cases to blindness in prematurely born children, is enhanced by the comparatively bright and constantly burning lights at pediatric intensive care stations. (10). Another proof that established health care does not always know what is good for our health. A lighting engineer like Blackwell, therefore, can much less be blamed for not knowing the health implications of high lighting levels.

Authorities that enforce lighting levels should be careful, however, to err on the side of safety.

I, therefore, plead for a revision to lighting levels recommended for classrooms, day cares and offices to levels that are closer to those recommended in Sweden (200 lux) or West Germany (350 lux).

2. POWER CONSERVATION THROUGH DELAMPING AND INCREASED LIGHTING EFFICIENCY

In 1983 Alberta Education issued lighting recommendations for classrooms of 500 lux, that had been introduced in Ontario already in 1981 by that province's Department of Education. At Edmonton Public Schools lighting levels prior to 1983 ranged between 700 - 1200 lux. After presentations to school staffs on the benefits of lower lighting levels, we proceeded cautiously by having custodians remove the tubes of fixtures to be delamped. After a week or two of getting used to the lower lighting levels, permission by teachers was obtained to permanently disconnect ballasts of delamped fixtures.

Fig. 2 Comparison of Illumination Recommendations for Schools

Areas	*IES (USA)*[a]	*IES (Britain)*[b]	*NYC Health Code*[c]	*Tinker*[d]
Classroom	70–150 fc	20–30 fc	30 fc	20–30 fc
Library Reading	30–70	30	30	15–35
Office	70–150	30	–	15–25
Drafting/Sewing	100–150	70	50	40
Washroom/Locker	20–30	7–10	10	–
Laboratory	100	30	–	–

[a] Derived from recommendations in the 1972 *Lighting Handbook* of the Illuminating Engineering Society of the United States.

[b] Derived from the 1961 lighting code of the British Illuminating Engineering Society.

[c] Derived from the 1959/1964 New York City Health Code.

[d] Derived from the recommendations of Miles A. Tinker.

Sources: Adapted from Richard G. Stein and Carl Stein, *Research, Design, Construction, and Evaluation of a Low Energy Utilization School* (Washington: National Science Foundation, August, 1974), pp. h-2/1 and h-2/2; Miles A. Tinker, *Bases for Effective Reading* (Minneapolis: University of Minnesota, 1965), pp. 233–234. in Lloyd Dumas' "The Conservation Response", 1976, pg. 91

There were a number of teachers who had more faith in IES than in the words of an energy consultant whom they suspected to be motivated mainly by his desire to conserve energy. Their lighting levels were not changed.

On the other hand we had many positive comments from those who consented to delamping. In the case of 4-tube fluorescent fixtures, two tubes were removed and one ballast disconnected. In classrooms with three rows of lighting frequently the middle row was disconnected, and in other cases every second or third fixture was delamped. This created a symmetrical checkerboard pattern and appealed to the sense of orderliness of teachers.

Care was taken not to remove fixtures at the end of rows. This measure provides more wall reflection and helps to maintain a more cheerful classroom.

In corridors where delamping would have created dark spots, so-called power reducers were installed in line with the ballast. Power reducers change the wave form of power supplied to the tubes and can be selected to reduce power consumption between 25 and 50%. This results in an equivalent drop in lighting level. At the same time the temperature of ballast and tubes drops by an amount sufficient to double the life of a new ballast. Power reducers cost less than a ballast.

A few years ago manufacturers of power reducers experimented with cheaper diode type reducers that proved unsatisfactory.

The coil type power reducers have proven reliable so far. The first we installed 5 years ago and none of them have failed.

Electronic ballasts that provide a power reduction of 33% with constant light output will take over the market in the next few years as they become cheaper.

The Wilson ballast that is presently being developed in Edmonton has a second feature: A switch on the ballast allows to gain 55% in power saving if a 13% drop in lighting level is acceptable.

Another Edmonton firm showed us a highly polished reflector that allows to convert two-tube fluorescent fixtures into one-tube fixtures, resulting in 50% power savings with only a 5% loss in light output. The combination of electronic ballast and high reflectance one-tube fixture, therefore, could lead to further dramatic reductions in lighting power usage even in delamped buildings.

3. REFERENCES

(1) John Appel and James MacKenzie, How Much Light Do We Really Need?, Bulletin of the Atomic Scientist, December 1974, pg. 19.

(2) Lloyd J. Dumas, The Conservation Response, D.O. Heath & Company, Lexington, 1976, pg. 80.

(3) H. Richard Blackwell, Development and Use of A Quantitive Method for Specification of Interior Illumination Levels on the Basis of Performance Data, Illuminating Engineering, (June, 1959).

(4) John Appel and James MacKenzie, Op.Cit., pg. 20-24.

(5) Miles A. Tinker, Bases for Effective Reading, Minneapolis: University of Minnesota, 1965, pg. 226.

(6) Peggy Evans, Effects of Lighting on Student Learning and Achievement, Edmonton Public Schools, 1987, pg. 1-2.

(7) John Ott, Health and Light.

(8) Miles A. Tinker, Op. Cit., pg. 208-209.

(9) Lloyd J. Dumas, Op. Cit., pg. 84.

10) Frankfurter Allgmeine Zeitung, August 21, 1985.

Heidi Stayke
Box 30, Site 4, RR1
St. Albert, Alberta
T8N 1M8
Jan 14th 1991

Alberta Environment
Alberta Energy
Alberta Forestry

Re: Clean Air Strategy

Health is one aspect of life most precious to most people. It seems only logical that we do the utmost to assure substantial reductions of CO_2, NO_x, SO_x, O_3, CFC, and VOC levels in Alberta.

From our perspective it is not good enough to tail world standards for cleaner air. Instead we should lead them; especially in the face of increased health threats to Albertans (highest Asthma death rate in Canada, for example). Also, because we have the highest per capita CO_2 production.

We support

- a carbon tax, and or
- higher fuel prices (the reasons for this action have to be sufficiently explained to the public)
- energy conservation (low costs/high profits,
- highest environmental standards and law enforcement for existing and new industries
- reformation of agriculture towards non-chemical methods (avoidance

p.t.o.

of nitrogen gas release) :

- no more clearcutting in Alberta (because we need more CO_2 absorbing trees not less)

We appreciate:

- information packages or leaflets as well as radio and TV education for the public (example: "Clean Air Strategy for Alberta")
- public participation throughout environmental decision making processes and beyond
- better environmental law enforcement than previously experienced

H - Stoyke

Godo Stoyke

Shunthula Manoharan.

A. Stoyke

A. Stoyke

155 Waterloo Drive S.W.
Calgary, Alberta
T3C 3G4
249-9120

December 11, 1990

Clean Air Strategy for Alberta
Bag One, Mail Room, Main Floor
North Tower, Petroleum Plaza
9945 - 108 Street
Edmonton, Alberta
T5K 2G6

Dear Sirs:

I am writing in response to your recent advertisements inviting written submissions in connection with the "Clean Air Strategy for Alberta" initiative.

The issue that I would like to see addressed is vehicle emissions. I am appalled at the number of vehicles on the roads in Alberta that spew out overly polluted exhaust fumes. In many cases, these vehicles will be travelling in a cloud of smoke (of their own creation) that you can smell many car lengths away.

I have tried to file complaints in the past against particularly offensive vehicles only to be told by the Police Department that there are no laws in the Province of Alberta regulating vehicle exhaust emissions. I had intended to write to my MLA about this apparent regulatory deficiency, however, it would appear that the "Clean Air Strategy" is a better forum to raise the issue.

I believe very strongly that there should be some regulations in place to limit the level of vehicle exhaust emissions to within prescribed levels that conform to conventional pollution control standards. I am sure that many people would support this.

The more difficult question is how best to enforce such regulations. I would like to offer a few suggestions.

First, I read an article in the Calgary Herald a few months ago about a device that was being used by the police in Toronto to enforce a vehicle exhaust by-law. Apparently this device (which appeared to be portable) was able to measure the "pollution level" of vehicle exhaust emissions. If the reading exceeds the specified limit, a penalty is presumably imposed. While the details in the newspaper were rather sketchy, it would be worth looking into this in more depth.

Cont'd.

The above process would fit in with the conventional system of police enforcement. In essence, it is no different than the authority vested in the police to stop any car that does not appear to be functioning in a safe manner (i.e. brake lights not working). In addition to any penalties that are imposed, it would also be critical to prohibit further operation of the vehicle until the exhaust problem is rectified.

Another system that I would like to propose would involve drive participation. Under this system, any driver could report the license plate number of any vehicle that he believes to be in breach of the requirements. The police could then arrange to check the vehicle. If it is in breach, the appropriate fine and "fix order" would be issued. If the vehicle is not in breach, the reporting driver would be required to pay a penalty, both to cover the cost of checking and to discourage careless reporting.

A driver participation scheme as outlined above might not result in a lot of reported incidents for a number of reasons including, possibly, general apathy. Such a system would likely, however, have a good self-policing effect. If an offending vehicle owner knows that anybody could report him (rather than just a police officer), he will be more inclined to have his vehicle fixed voluntarily before he is caught.

I hope that these ideas are of some assistance to you and that you are able to come up with a program to effectively reduce vehicle exhaust emissions.

Yours truly,

Mark Wayne

MW/jb

PART

2

Clean Air Strategy for Alberta

Report on the Regional Sessions

Volume III: *Written Submissions*
Part Two

Report on the Regional Sessions

Volume III: *Written Submissions Part Two*

This document is Volume III, part two, of the *Report on the Regional Sessions*. Volume I is the *Moderator's Report*. Volume II is the *Verbatim Transcript* of the public meetings. Volume III, parts one and two, are the *Written Submissions*. Part one is submissions from governments, industry and individuals and part two is from public interest groups and schools. Volume I has wide distribution and may be obtained at the address below. Volumes II and III, parts one and two, are on file at many public libraries for public access and for inter-library loan.

ISBN 0-86499-832-5
Pub. No. I/418
1990-91

Clean Air Strategy for Alberta
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(403) 427-9793

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Jessica Wildeboer

SCHOOL EAST EDMONTON CHRISTIAN SCHOOL

TEACHER Mrs M Verbeek

GRADE 5

DATE

Dear Minister of Energey and Enivirment

Many people say that they don't like pollution but they do it esey way. I think me as a christian should clean up my act and start making this world that GOD made CLEAN, Many people are consernd about the Ozone Layer because there is a hole in it but they don't do enything about it. But my question is why do people pollute? I think people pollute because they don't care about the earth or the Ozone layer. I hope you care about the Ozone layer as much as I do. It is true that there is a hole in the Ozone layer the hole is there cause of all the pollution. I think you should do something about it. The

Ozone layer prelecs us from the sun and if we didn't have the Ozone Layer lots of people have skin cancer or they might die.

Sincerely
YOURS
JESSICA

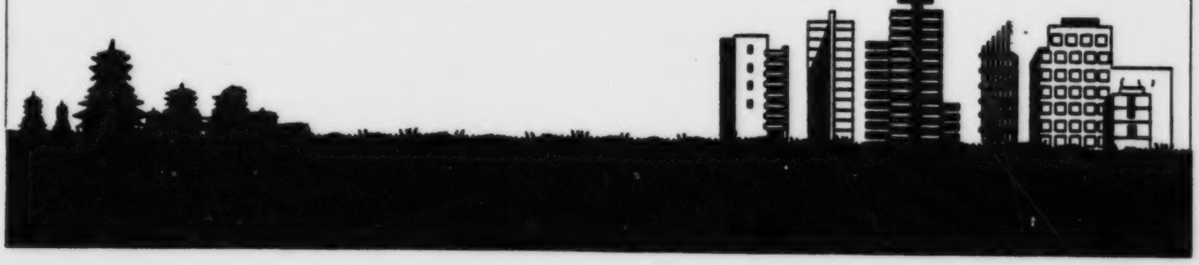
Clean Air Strategy for Alberta

Response Form

Michael Klaassens
STUDENT'S NAME
East Edmonton Christain School
SCHOOL
Mrs. M. Verbeek
TEACHER
Five
GRADE
January 11, 1991
DATE

Dear Ministers of Energy and Environment:

I'm willing to write this letter about air pollotution and what we can do about it. If this polluting goes on, we won't have any more wildlife left. Air pollotution is harmful to the environment and the ozone layer. There are holes above the north and sorth poles. I think that air pollottion is a very terrible thing. We should try to use cars less or use solar powered cars. Pretty soon if we don't stop polluting, the sun might kill everything on the earth. We might have to wear gas masks or vacuum suits when we grow up. Acid rain is another result of our carelessness. I ~~also~~ think that the Swan hills plant sholld be shut down I also think that you should ban cfc's and Radioactive materials. Being a Christian makes me more angry of the carelessness of the people of this world.



Yours
Truly,
Michael
Klaassens

Clean Air Strategy for Alberta

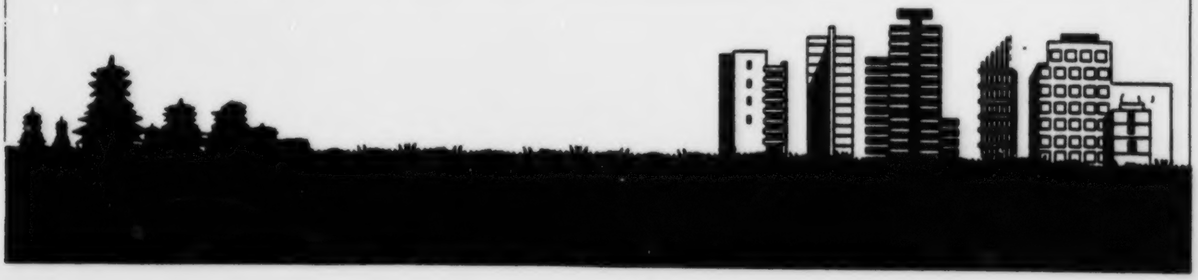
Response Form

Jennifer Van Eerden
STUDENT'S NAME
East Edmonton Christian School
SCHOOL
Mrs. M. Verbeek
TEACHER
5
GRADE
DATE January 11, 1991

Dear Ministers of Energy and Environment:

I am writing about air pollution.

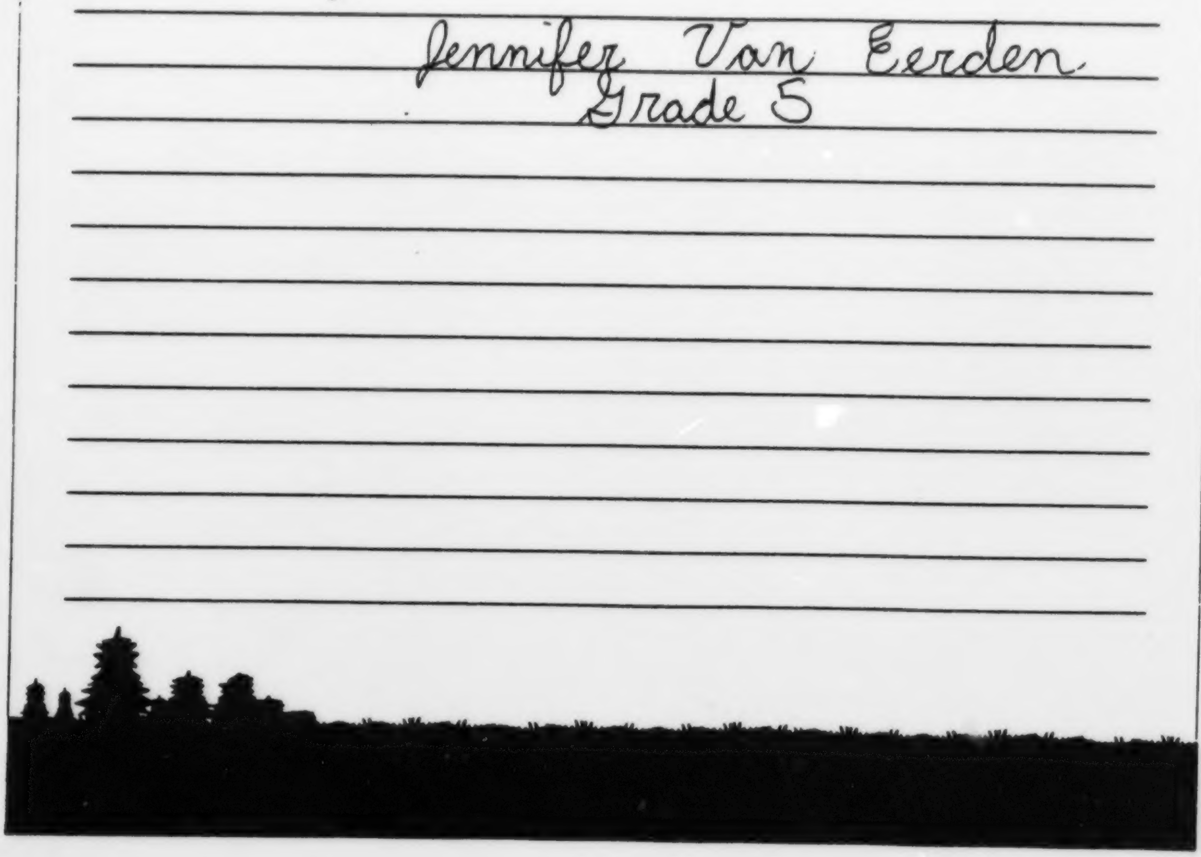
My opionion about air pollution is that there should not be as much as there is. The government should do something about it he is the leader he should do something. Everyone should help to not pollute the air. It is harmful to us as people. It may also be harmful to the birds that fly and other animals. When children grow up to be adults we may have to wear gas masks. S why don't we do something abot air pollution.



I'm a christian and I think we should do something to save God's world. He called us to take good care of it and now look what we're doing, we're ruining it. So let's do something to save God's creation that he made. Save God's creation by keeping it clean!

Your's Sincerely,

Jennifer Van Eerden
Grade 5



Clean Air Strategy for Alberta

Response Form

Julie Moes
STUDENT'S NAME

East Edmonton Christon School
SCHOOL

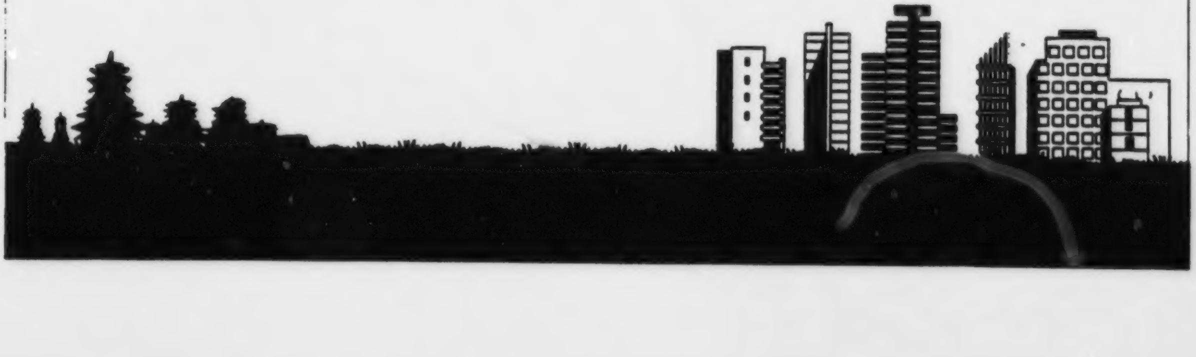
Mrs M Verbeek
TEACHER

5
GRADE

Jan.11,1991
DATE

Dear Ministersof Energy and Environment:

I'm writing this letter to tell you about the Ozone layer and what I think about it. The ozone layer has holes in it if the ozone layer get's more holes in it the water on the earth will evaporate faster. There will be more heat on the earth and more people have heart disease and can died from it. I as a Christain think it's bad and it's ruining God's creation and God made the world to live



in not to destroy it. So please do something about it now.

Yours Sincerely,
Julie Moes.

Clean Air Strategy for Alberta

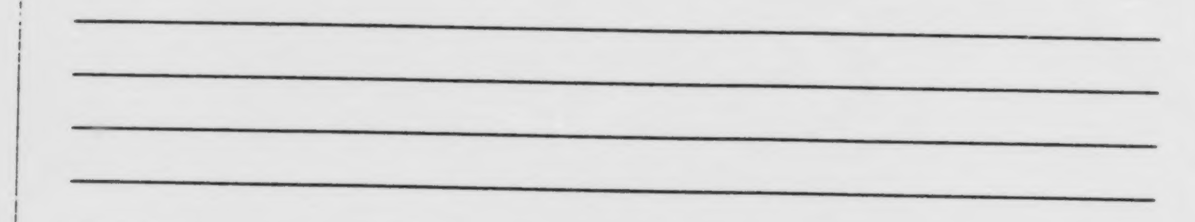
Response Form

Joshua Meloychuk
STUDENT'S NAME
East Edmonton Christian School
SCHOOL
Mrs. M Verbeek
TEACHER
5
GRADE
Jan. 11, 1991
DATE

Dear Ministers of Energy and Environment:

I guess this letter is to tell you about air pollution. Pollution is very very bad to the ozone layer. Chloroflourocarbons are putting holes in the ozone layer. If this keeps going on you might have to start supplying gas masks or vacuum suits for us. There is no way to stop the pollution thats already in the air maybe not even what we're doing on earth. We should have those solar powered cars that raced around Australia. We should start using paper and other stuff that doesn't affect the environent. If we could do something we should do it now. As a christian I think God made this world for us to take care of so we should not litter and try and not pollute the earth as much as we can.

Sincerely yours,
Joshua



Clean Air Strategy for Alberta

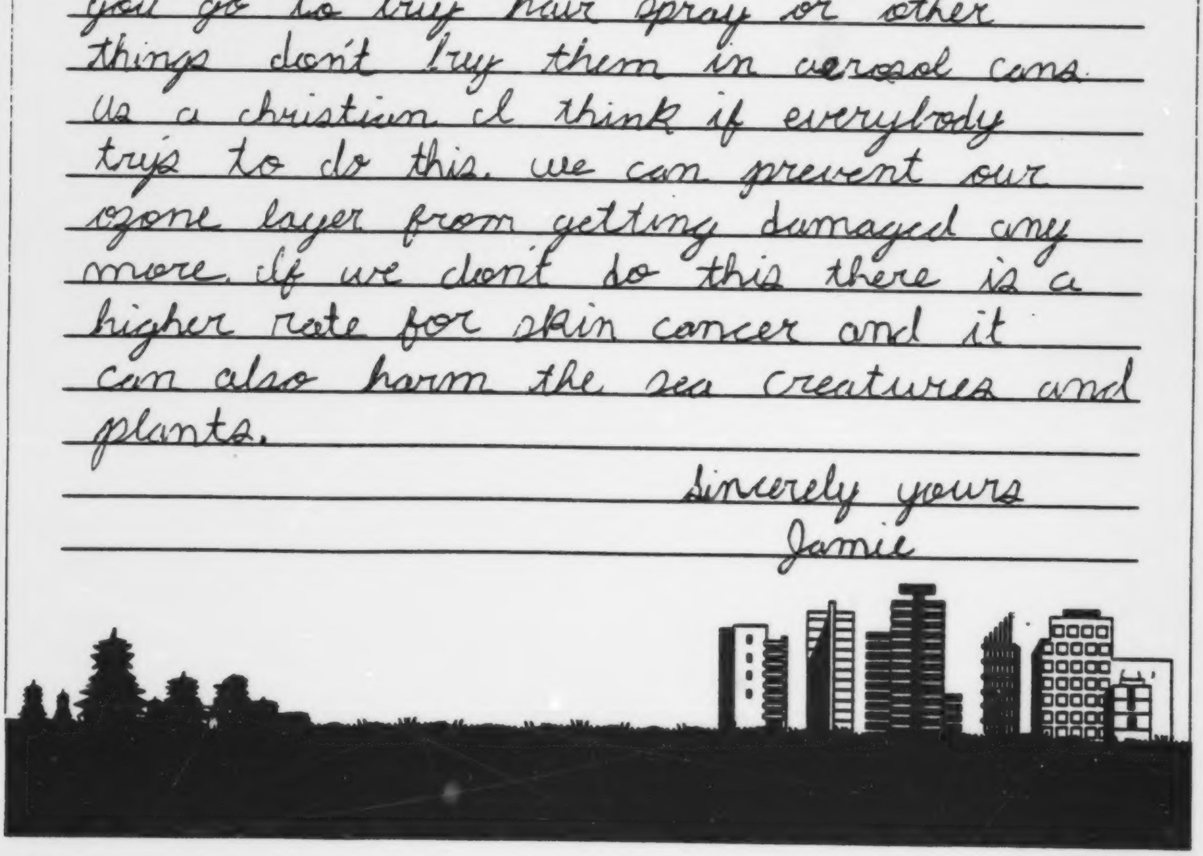
Response Form

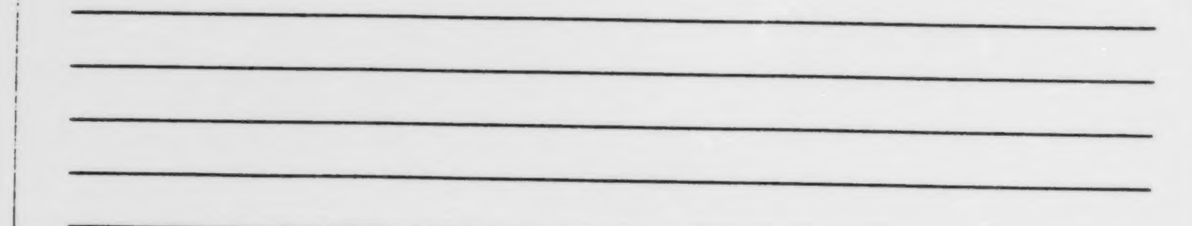
Jamie Lundin
STUDENT'S NAME
East Edmonton Christian School
SCHOOL
Mrs. M Verbeek
TEACHER
5
GRADE
Jan. 11, 1991
DATE

Dear Ministers of Energy and Environment:

Many people are concered about the ozone layer most people are, but what do they do about it. There are only some simple things to remember recycle your plastics and insalations and next time you go to buy hair spray or other things don't buy them in aerosol cans. As a christian I think if everybody trys to do this. we can prevent our ozone layer from getting damaged any more. If we don't do this there is a higher rate for skin cancer and it can also harm the sea creatures and plants.

Sincerely yours
Jamie





Clean Air Strategy for Alberta

Response Form

Kathryn VanDenBoogaard
STUDENT'S NAME

East Edmonton Christian School
SCHOOL

Mrs. M. Verbeek
TEACHER

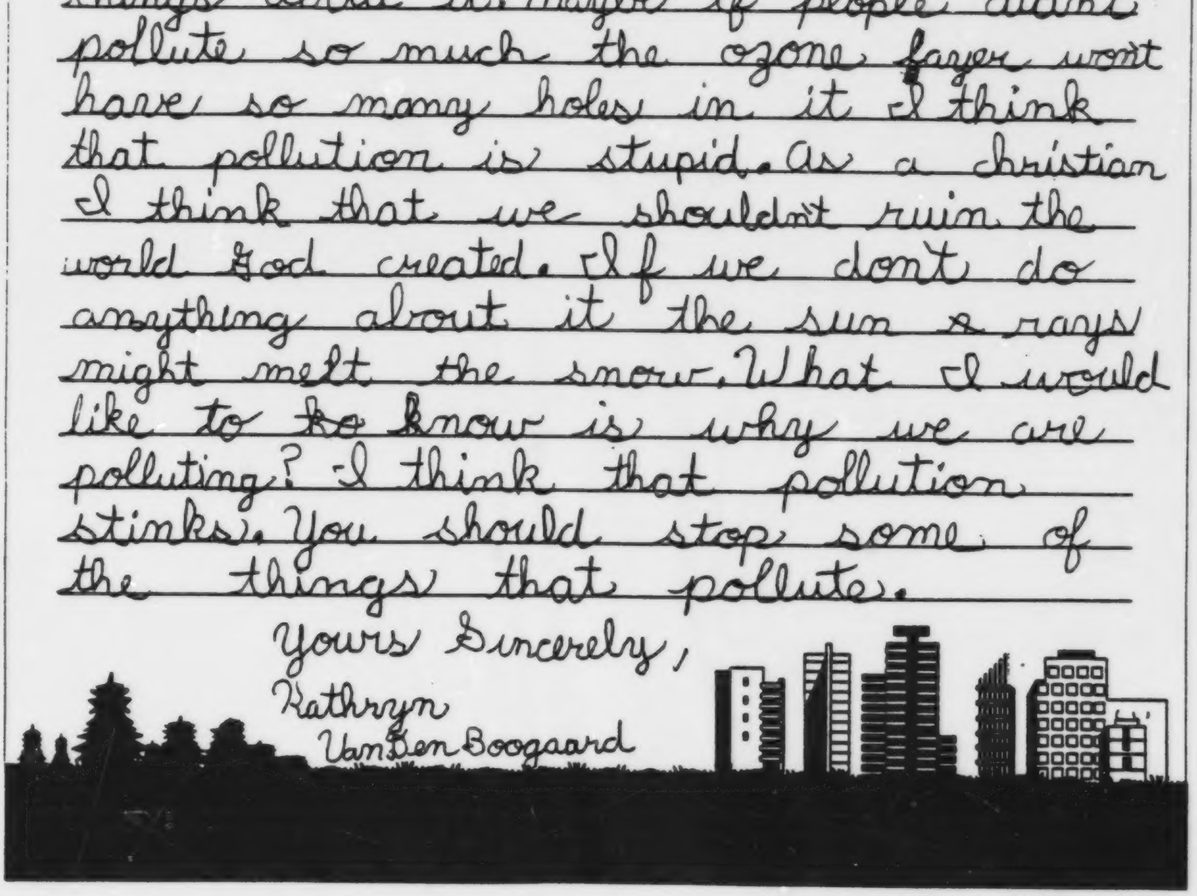
Grade 5
GRADE

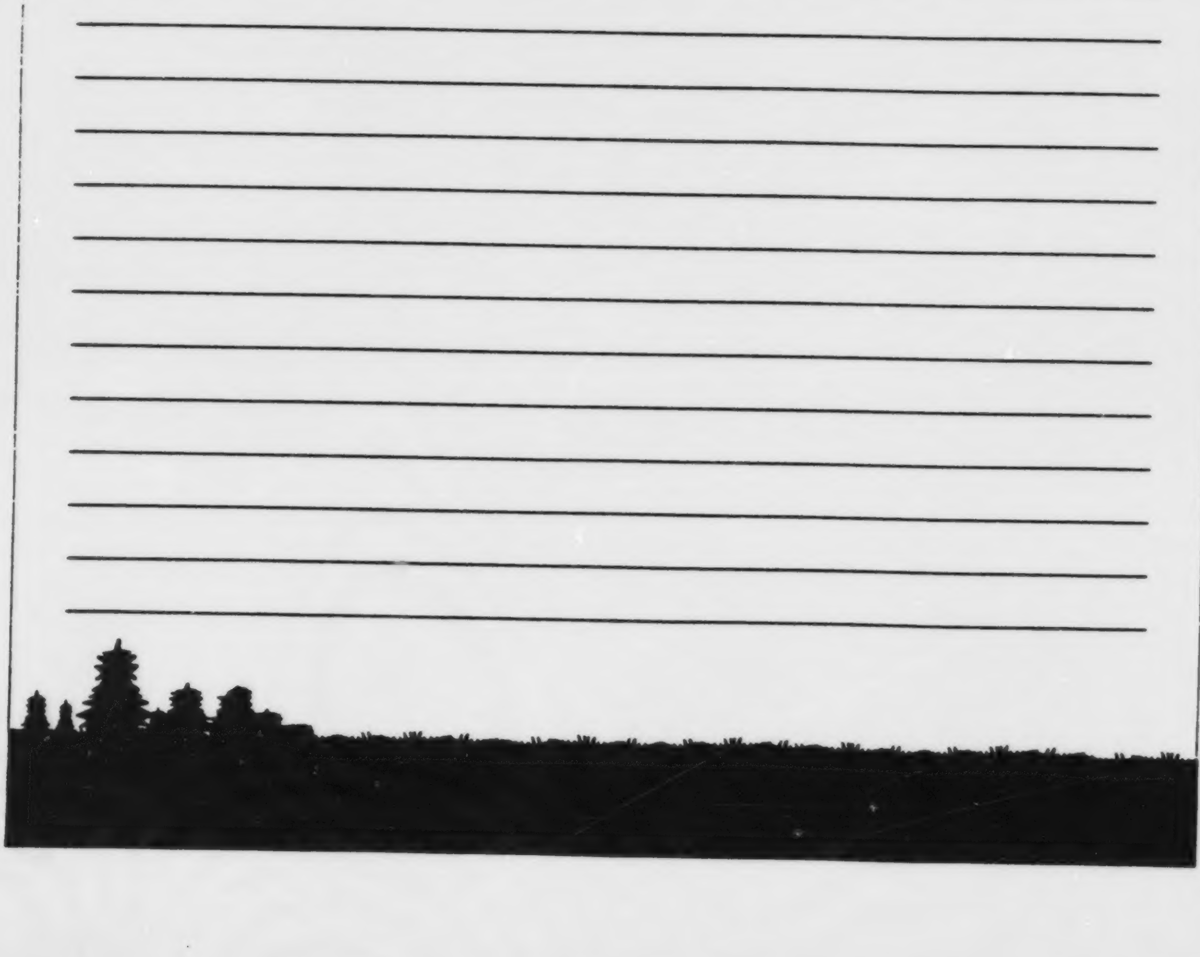
Jan. 11, 1991
DATE

Dear Ministers of Energy and Environment:

Many people say that if the ozone layer has to many holes in it we might get skin cancer. I would really like it if people would start doing things about it. Maybe if people didn't pollute so much the ozone layer won't have so many holes in it I think that pollution is stupid. As a christian I think that we shouldn't ruin the world God created. If we don't do anything about it the sun s rays might melt the snow. What I would like to ~~ko~~ know is why we are polluting? I think that pollution stinks. You should stop some of the things that pollute.

Yours Sincerely,
Kathryn
VanDenBoogaard





Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Michael Rietveld

SCHOOL East Edmonton Christian School

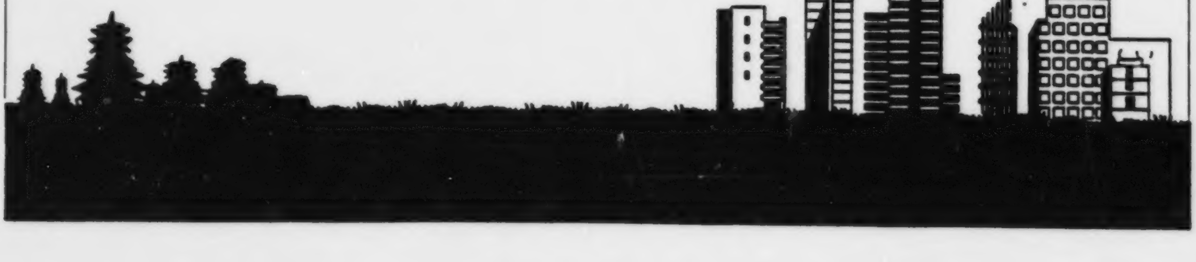
TEACHER Mrs. M. Verbeek

GRADE 5 **DATE** Jan. 11 1991

Dear Ministers of Energy and Environment

Pollution is stupid the government should stop all the factorys and make solar power cars and trucks. We should also recycle all plastics and all things that harm the earth. All the pollution is also bad because it is going to give us skin cancer and people are going to get sick and die. The animals are going to die out and the fields of wheat, and if there is no wheat can't make bread, buns or dough to make stuff with. So stop pollution. I think that if we would make fridges that don't bram the earth and in the summer we should walk more not drive. As a Christian I know God made the Earth that we live on and we are killing it. If it wasn't for God you wouldn't be here So CLEAN UP the EARth For God

Yours Sincerely Michael Rietveld



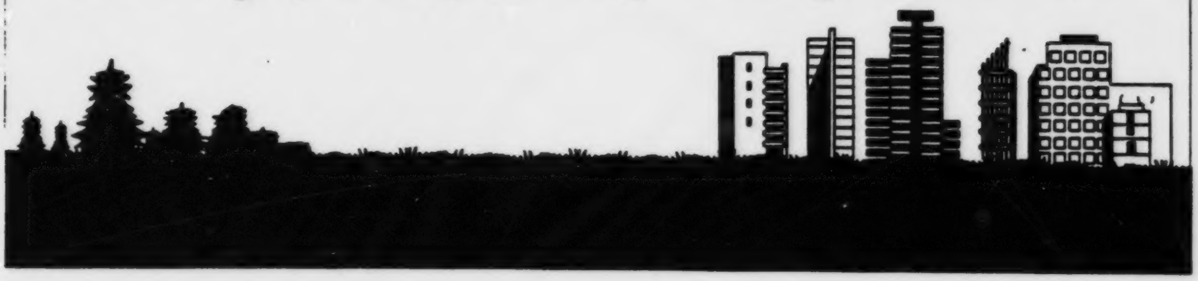
Clean Air Strategy for Alberta

Response Form

Tanya Mantel
STUDENT'S NAME
East Edmonton Christian
SCHOOL
Mrs. M. Verbeek
TEACHER
Grade 5
GRADE
Jan 11 1991.
DATE

Dear. Ministers of Energy and Environment:

Why do we pollute our air? We pollute our air because some people don't care. It will soon kill plants and animals and start to harm us. I as a Christian think its ruining Gods creation and we should try to make it as clean as we can for the generations to come. I think that people who want to be rich and have lots of money and don't care if their ruining God's creation are immature and irresponsible. Pretty soon the world will be so polluted that we will have to where gas masks to avoid it. We will also have to put our food in special bags and their will be no nature and animals to look at. Some artists like going outside and looking at trees and copying them, Well they won't get to do that



anymore. My last point is that the seniors of Canada like looking at the seenery, Well there won't be any left except for dead trees and stumps so soon when were all dead and other people are here there will be no use for living because the world will be ruined. So we should work together and fix the world ~~bf~~ before that does happen.

~~Sincerel~~

~~Sincerely yours~~

Sincerely Yours,

Tanya Mantel

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Jennifer Scaterse

SCHOOL East Edmonton Christian School

TEACHER Mrs. M. Verbeek

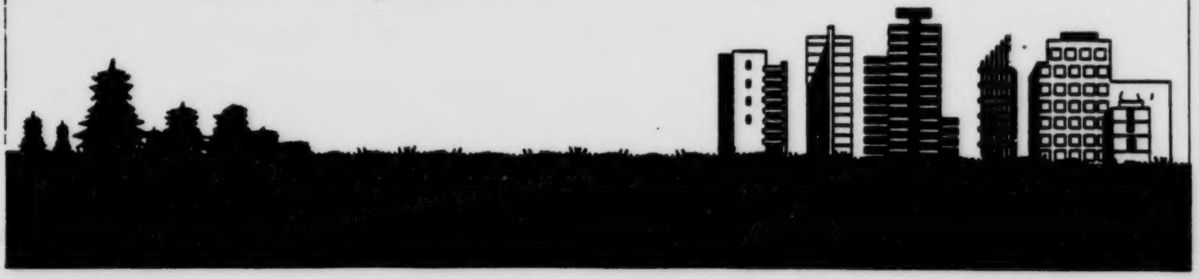
GRADE Grade 5 DATE January 11, 1991

Dear Ministers of Energy and Environment:

Why do we pollute our air? I think air pollution should not be allowed because it is ruining God's creation, killing plant's and animals and will start to harm us. There should be a reinforced law ~~about~~ against littering and polluting our world

Some ways I think we can stop this problem is by cutting back on harmful makings like aerosol cans, styrophoam, insulation and so on. We should also try our best to recycle and make recyclable products.

Our world is in danger because of this air pollution problem and I think the Government and the citizens of Alberta should work together to solve this problem.

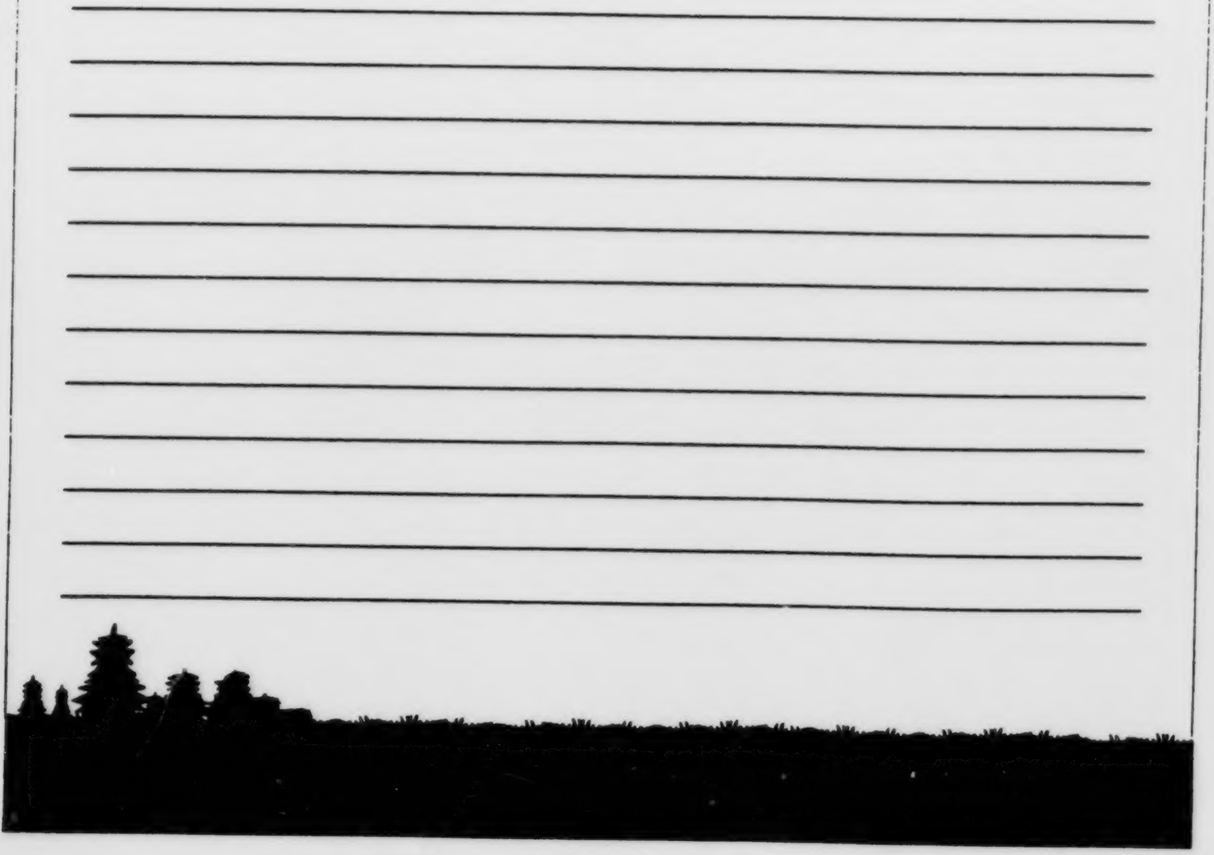


As a Christian I think that God gave us this world to take care of and I will try my best to keep our world clean and do my part to make this world a better place to live in, and everyone should be responsible and look into the future and see what we can do now to save our world.

Yours Sincerely,

Jennifer

Scaterse



Clean Air Strategy for Alberta

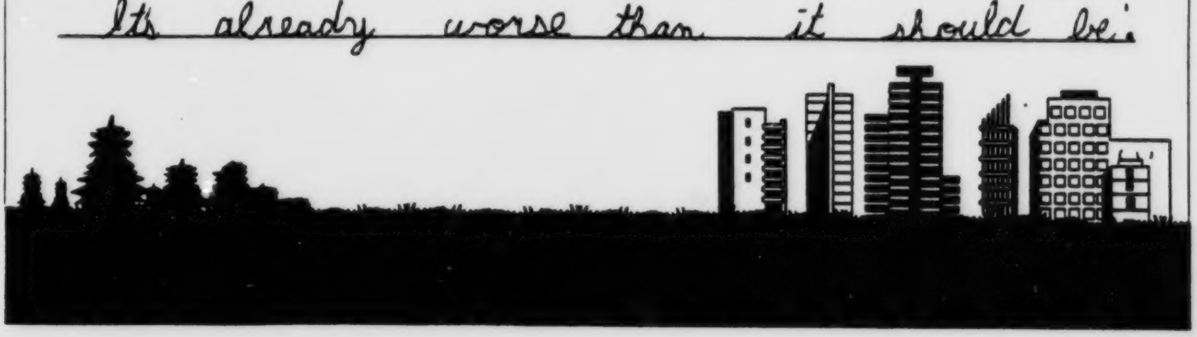
Response Form

Angela Van Essen
STUDENT'S NAME
East Edmonton Christian school
SCHOOL
Mrs. Verbeek
TEACHER
5
GRADE
DATE

Dear Ministers of Energy and Environment,

People say that our world is getting very polluted. But why don't they do any thing about it?

I'm talking about the air in general, if we really stuck our heads Together and did something about it . . . . I'm not just talking about little things, I'm talking about everyone. We can all get togather and I mean the prime minister, George Bush, Mulrony, everyone! If we don't do something in a couple of years the ozone layer is going to be extinguished, and the acid rain will be even worse! Its already worse than it should be.



If we aculy live till the year 2500 well be breathing bottled air! I mean we can at least stop making fridges with chlorofluorocarbons and stop using non-recyclable things it will be a good start.

We can't do every thing on our own but I'm sure with Gods help we can do it. As a Christian I think theres way more to life than money, and business. And still we should be more loving to anamals, natur, and Gods whole earth.

Yours Sincerely

Angela Van Essen.

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Sheri Moon
SCHOOL East Edmonton Christian School
TEACHER Mrs. M Verbeek
GRADE 5.
DATE Jan 11, 1991

Dear ministers of Energy and Environment:

Why do we polute the air?

Air polution is ruining God's creation. We should recycle every thing that can be recycled

It is causing the ozone layer to deplete.

It is killing animals, and is starting to harm us.

There should be a reinforced law against littering and poulting.

We should filter the smoke that comes out of fractories.

We should cut back on aerosol cans, styrofoam etc.

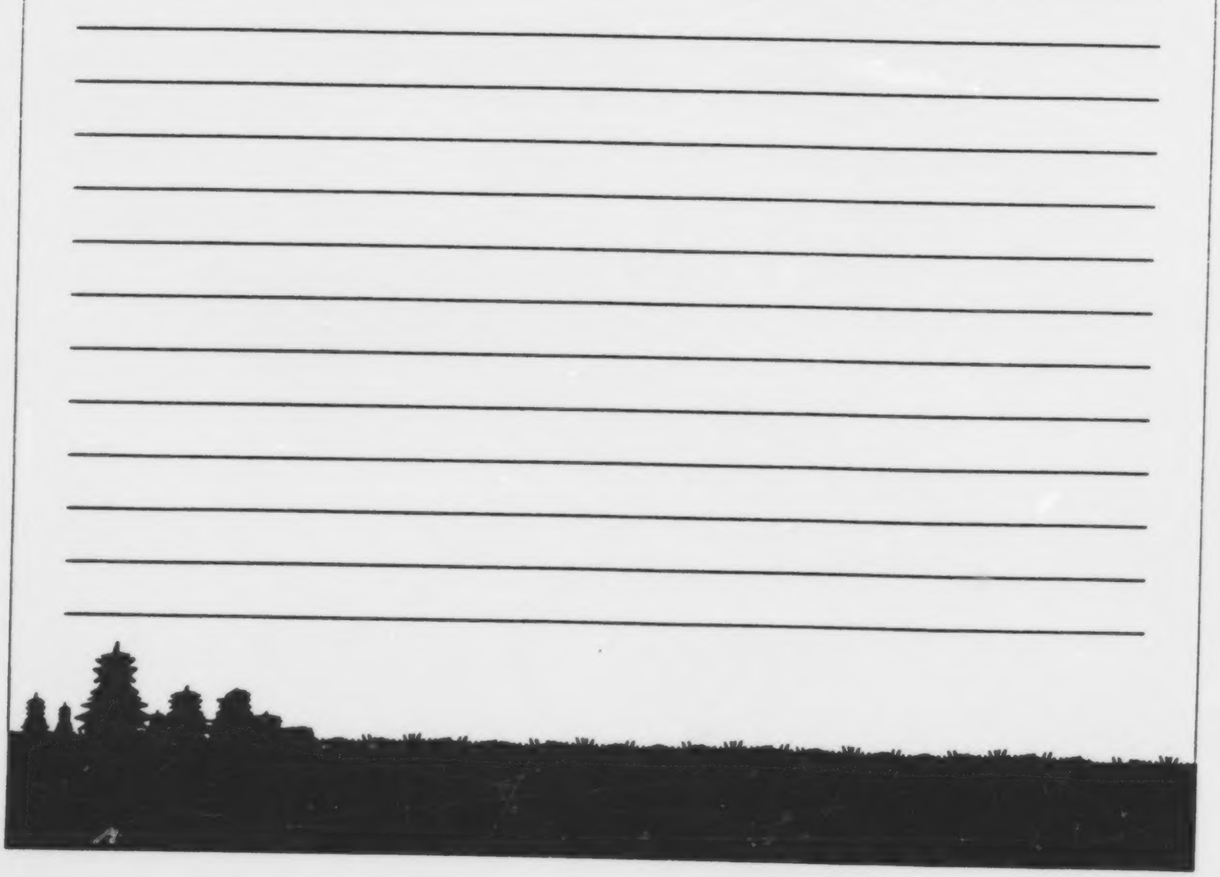
The government should be

more serious about pollution.

As a christian I think that we shoudn't ruin Gods creation.

I will try my best to keep this world clean.

Yours truly
Sheri Maon



Clean Air Strategy for Alberta

Response Form

Andy van Popta
STUDENT'S NAME

East Edmonton Christian School
SCHOOL

Mrs. Verbeek
TEACHER

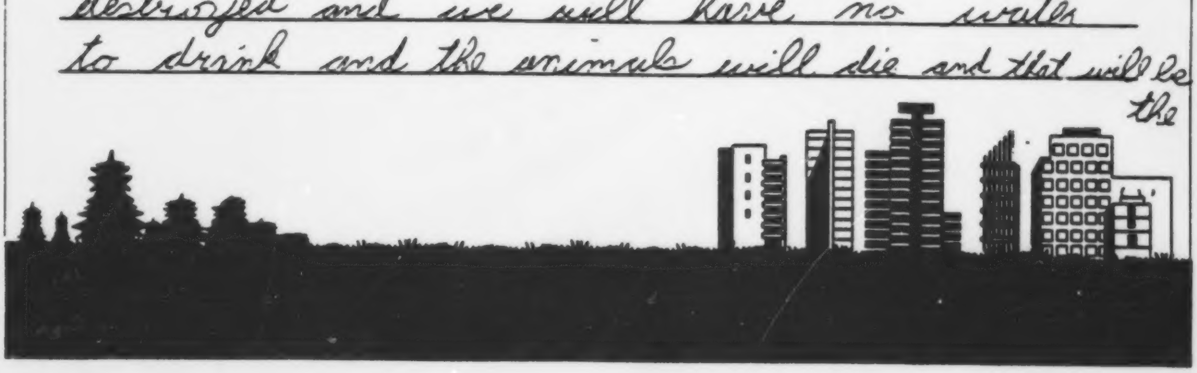
5
GRADE

Jan. 11 1991
DATE

Acid Rain

Dear Ministers of Energy and Environment,

Is acid rain killing us? I think is killing us because acid rain is killing our animals and lakes. In the end we will perish. Acid rain comes from factories and travels long distances and rains on all our lakes and forests killing our world. You people better do something about it because you are destroing it for us!!! When we are older we are going to have to wear those gas masks!!! As a Christian I think pollution is a sin. The lakes will be destroyed and we will have no water to drink and the animals will die and that will be the



Ende

Yours turly
Andy

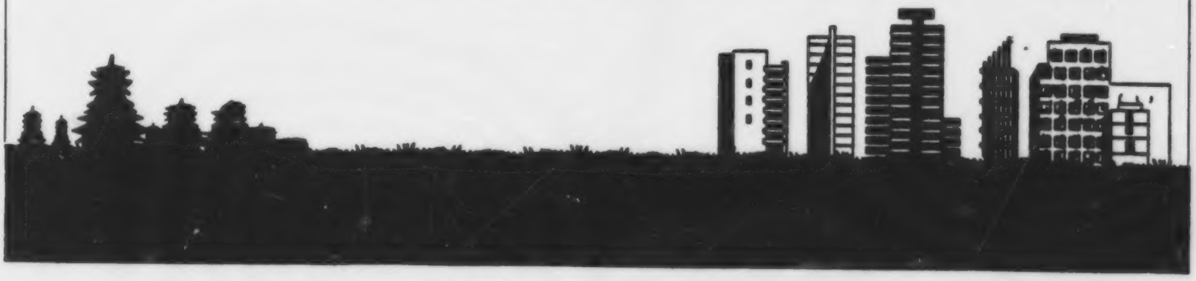
Clean Air Strategy for Alberta

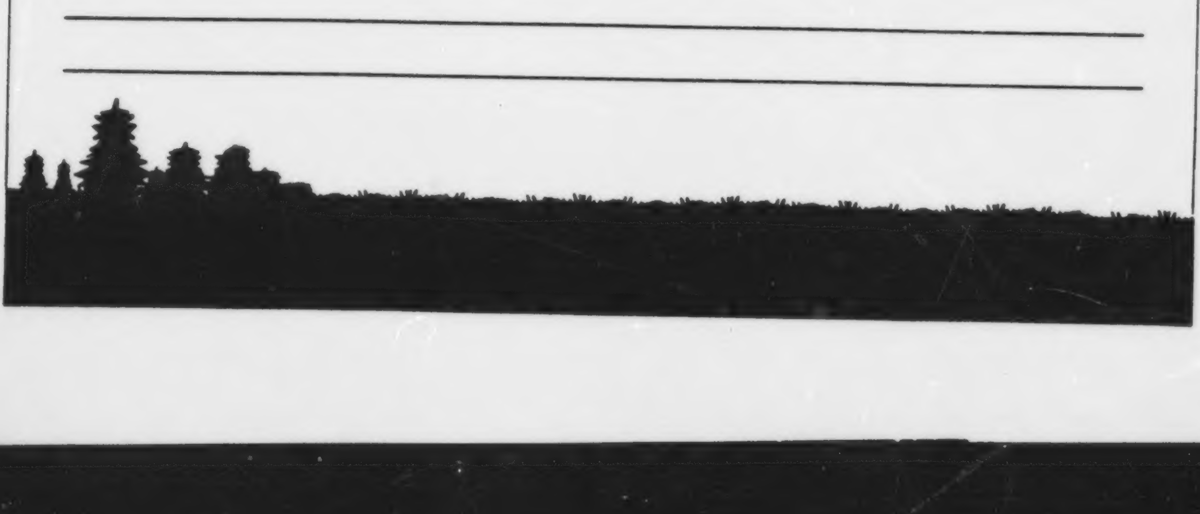
Response Form

STUDENT'S NAME Tyler Nodwell
SCHOOL East Edmonton school
TEACHER Mrs. M. Verbeek
GRADE 5 DATE Jan. 11, 1991

dear Ministers of Energy and Envirionment: Air pollation comes from chimneys it killes animals. The Green house ~~ef~~ effect is from burning coals and ~~ofter~~ other fills. we can stop the problem be ~~c~~ because the suns heat gets traped in Gases that are ~~in~~ from pollation. I dont like air pollation be cause it kills god creation it should be stoped

your sincerely, tyler nodwell





Clean Air Strategy for Alberta

Response Form

Jeremy Wybenga
STUDENT'S NAME

East Edmonton Christian School
SCHOOL

Mrs. M. Verbeek
TEACHER

Grade 5
GRADE

January 11, 1991
DATE

Dear Minister of Energy and Environment:

Is acid rain killing us? I think it's ruining our animals and lakes. In the end we will all die. It comes from factories and then it goes through the air and acid rain destroys our nature. You should do something about it or we could die. When I am older I hope it will all change. If you don't do anything about it we will have to wear gas masks. As a Christian I think it is a bad sin, [illegible]. I'm going to try and use solar power stuff. Then hopefully there's hardly any smoke. Try and do something about it. If there was no pollution there would be no acid rain.

Yours truly Jeremy Wijbenga

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Adam Wirtz

SCHOOL East Edmonton Christian School

TEACHER Mrs. M. Verbeek

GRADE 5

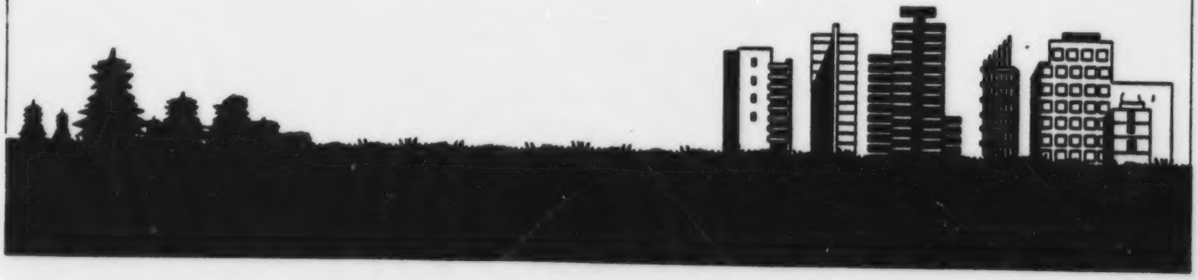
DATE Jan 11, 1991

Dear Ministers of energy and environment,

We should do something about the pollution. If we dont stop the pollution it will kill animals and effect the world and then we could not have a normal life so we should help To stop pollution. It would be very good to the world if we could stop the pollution. As a Christian I think we should save Gods world it would be good to all of us, the animals, the plants and the water.

Yours Truly,

Adam



Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Steven J. Luciw

SCHOOL East Edmonton Christian School

TEACHER Mrs. M. Verbeek

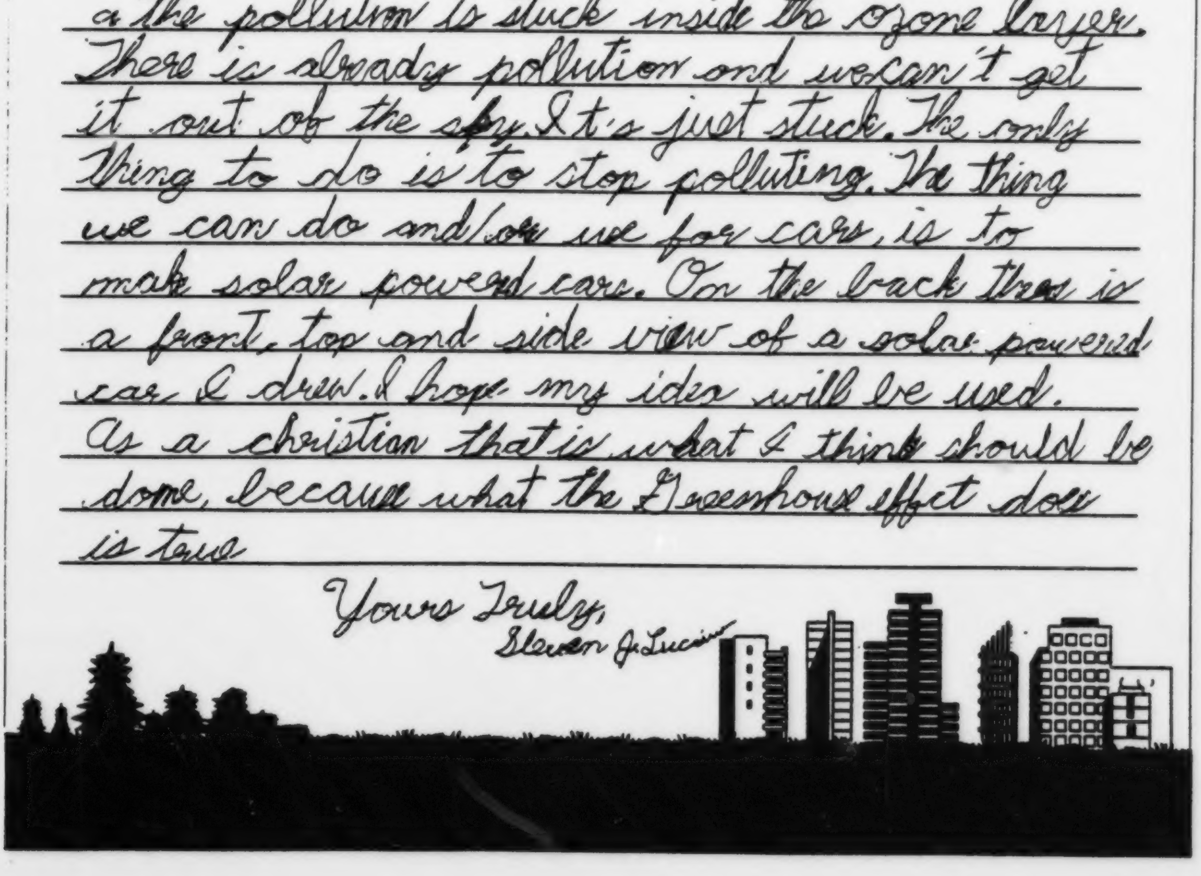
GRADE 5

DATE January 11 1991

Dear Minister of energy and envirorment.

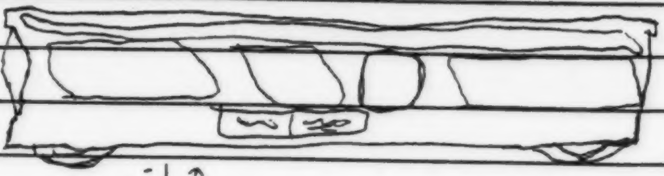
This essy I guess is for telling you about how- to me there is nothing we can really do about the pollution that is already in the atmosphere. To me all cars pollute a the pollution is stuck inside the ozone layer. There is already pollution and wecan't get it out of the sky. It's just stuck. The only thing to do is to stop polluting. The thing we can do and/or we for cars, is to make solar powerd cars. On the back thres is a front, top and side view of a solar powered car I drew. I hope my idea will be used. As a christian that is what I think should be done, because what the Greenhouse effect does is true

Yours Truly,
Steven J. Luciw

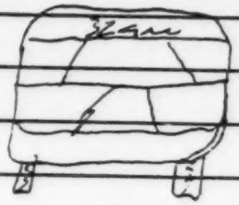


Solar powered Bus and car

Bus



side↑



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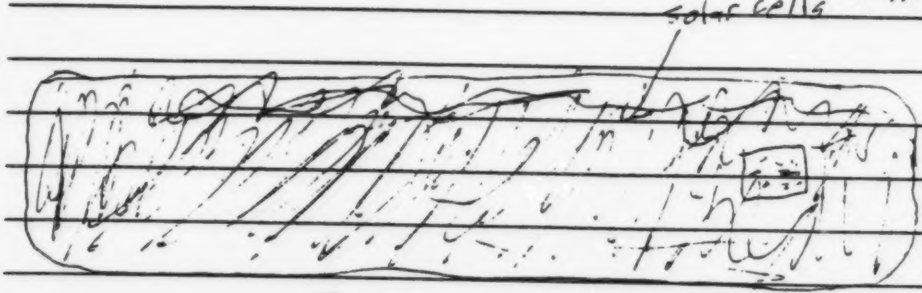
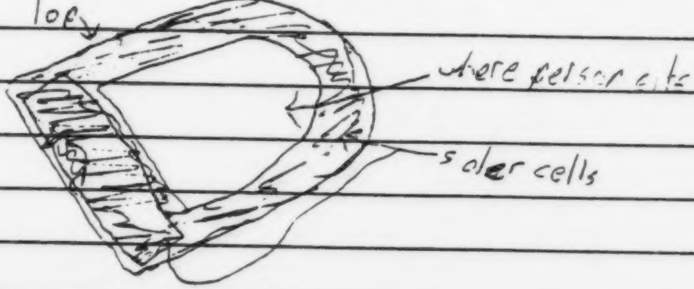
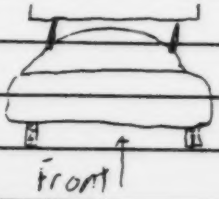
Front

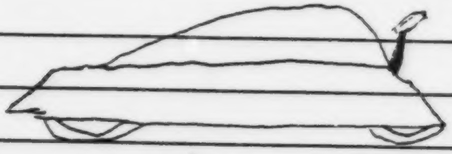

solar cells

Top↑


Toe
where person sits
soler cells



front↑



side

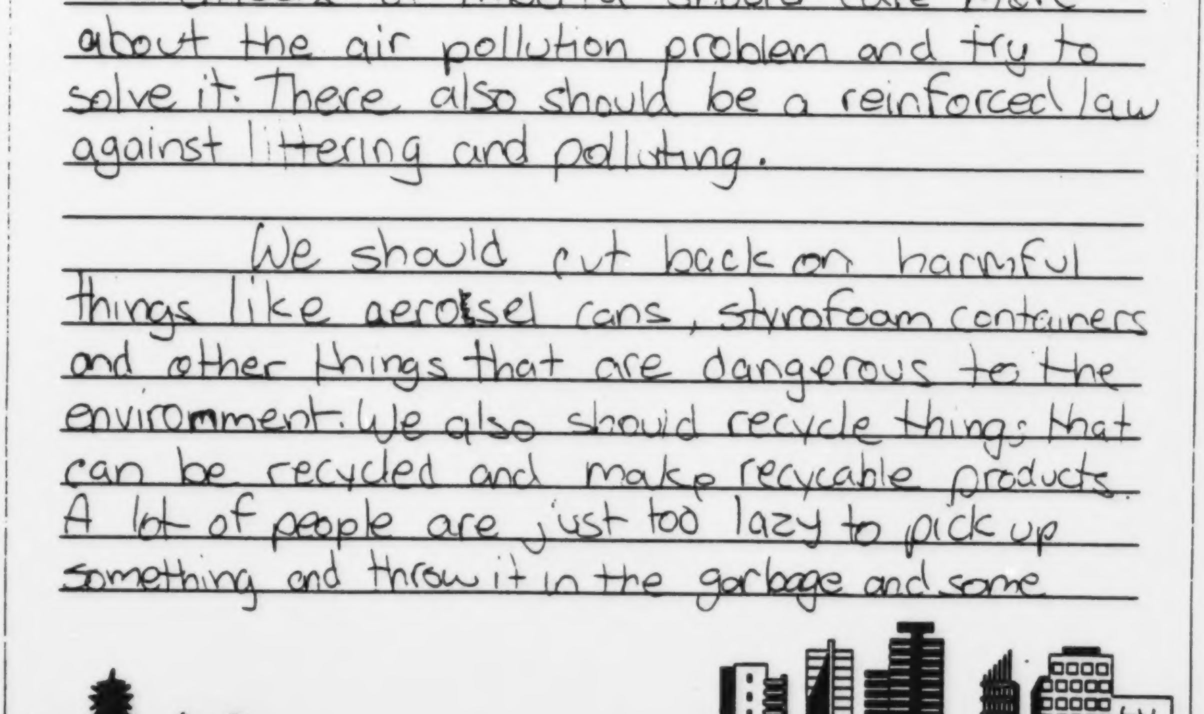
Clean Air Strategy for Alberta

Response Form

Anne Schuurman
STUDENT'S NAME
East Edmonton Christian School
SCHOOL
Mrs. M Verbeek
TEACHER
Five
GRADE
January 10, 1991
DATE

Dear Ministers of Energy of Environment;
Why do we pollute the air? When all it does is ruin God's creation, cause the ozone layer to deplete, kill plants and animals and put us in danger. I think that the goverment and the citizens of Alberta should care more about the air pollution problem and try to solve it. There also should be a reinforced law against littering and polluting.

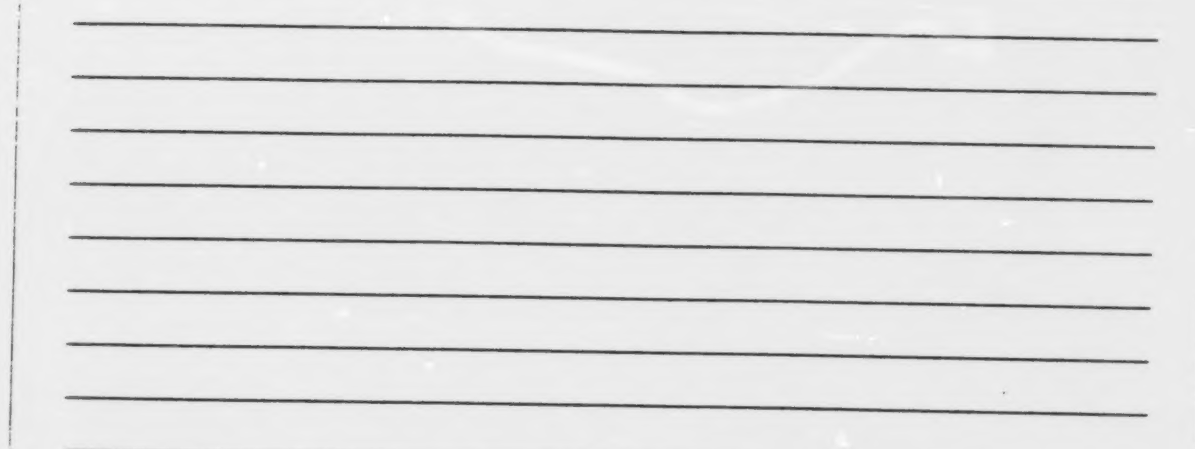
We should cut back on harmful things like aerosel cans, styrofoam containers and other things that are dangerous to the enviromment. We also should recycle things that can be recycled and make recycable products. A lot of people are just too lazy to pick up something and throw it in the garbage and some



people even just drop it on the ground. I don't think that people should be allowed to do that.

As a christian, I think that the Lord gave us this world and we should take care of it for ourselves and everything. I will do my best to keep this world clean and healthy and you should too.

Sincerely Yours,
Anne Schuurman.



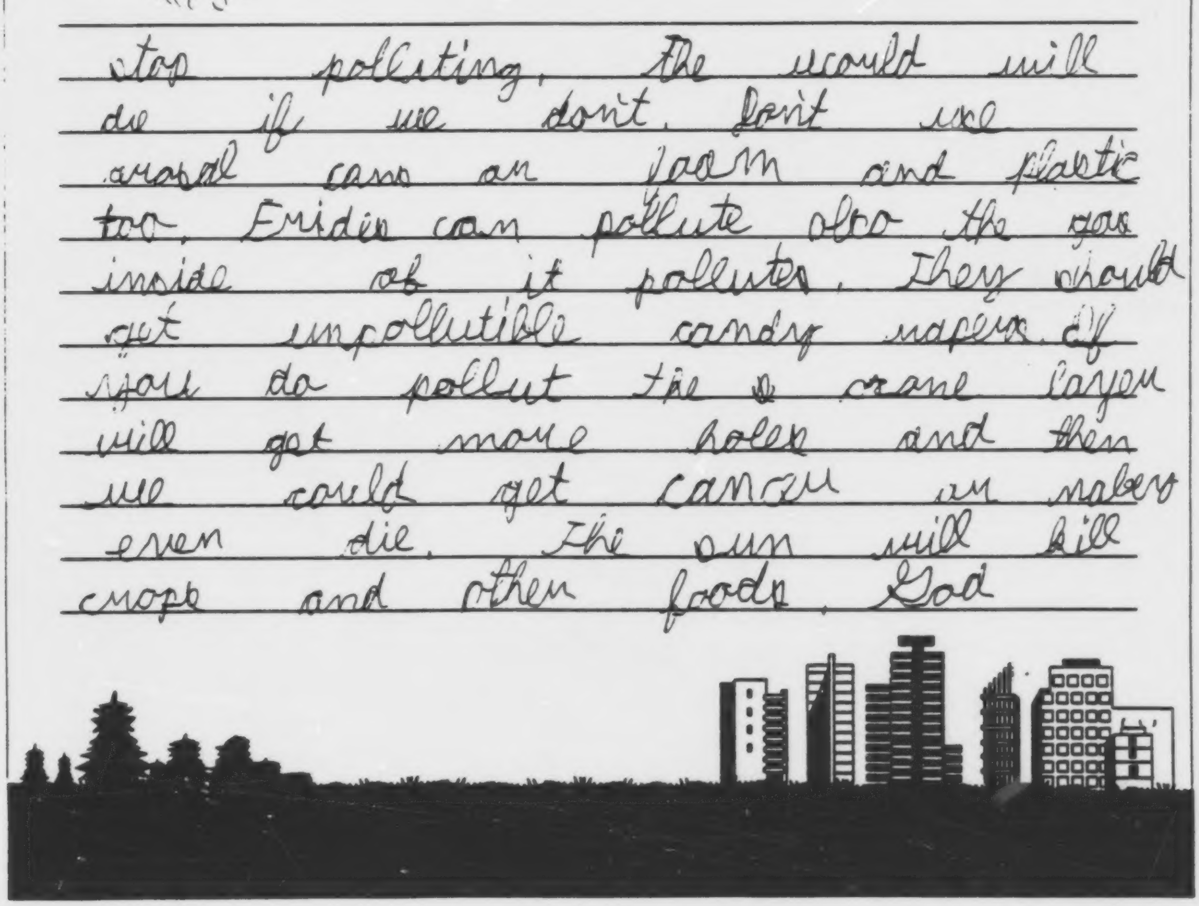
Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Richard
SCHOOL East Edmonton Christian School
TEACHER Mrs. M. Verbeek
GRADE 5 DATE Jan. 11, 1991

Dear Ministers of Energy and environment:

¡Stop! I think we should stop polliting. The would will die if we don't. Don't use arosal cans an foam and plastic too. Fridges can pollute also the gas inside of it pollutes. They should get unpollutible candy rapers. If you do pollut the ozone layer will get more holes and then we could get cancer or mabey even die. The sun will kill crops and other foods. God



made this world to use wisly
and not to pollute. So don't
pollute it.

Sincerely yours

Richard

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Carmen

SCHOOL East Edmonton Christian school.

TEACHER Mrs. Vesirek.

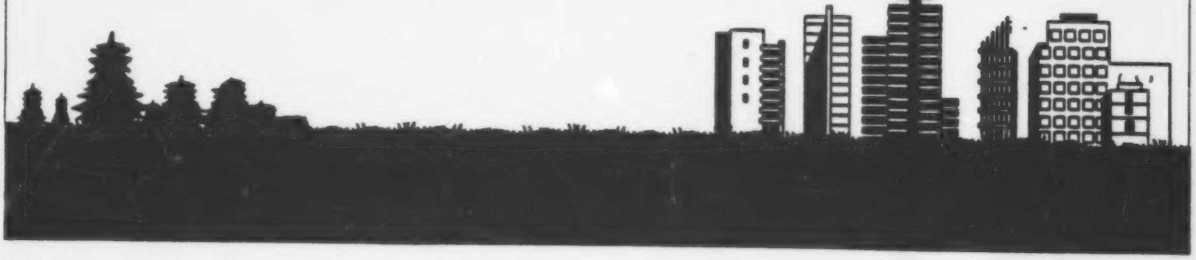
GRADE 5.

DATE Jan. 18, 1991

Dear Ministers of Energy and Enviroment.

I am in grade five and I think we should clean up the world. Most of us would like to live in a clean pretty place. We should stop driving cars too much because we get bad lungs.

If we don't stop air pullation now the world would not be a safe place to live in. I think we should not use our cars to much. We should like to work take the city bus, walk and then we should have a nice place to live in if we don't stop ~~fast~~ air pullution it is going to kill the animals and plants, it could even kill us as well if we don't stop fast. I think that we should not polute the air. I think we should have a place to live in like back then.



As a Christian we should start to clean act right now and clean the air pollution I think we should stop pollution in the ozone layer then it would be saved. I think the Greenhouse should be a better place

Yours

Sincerely,

Carmen.

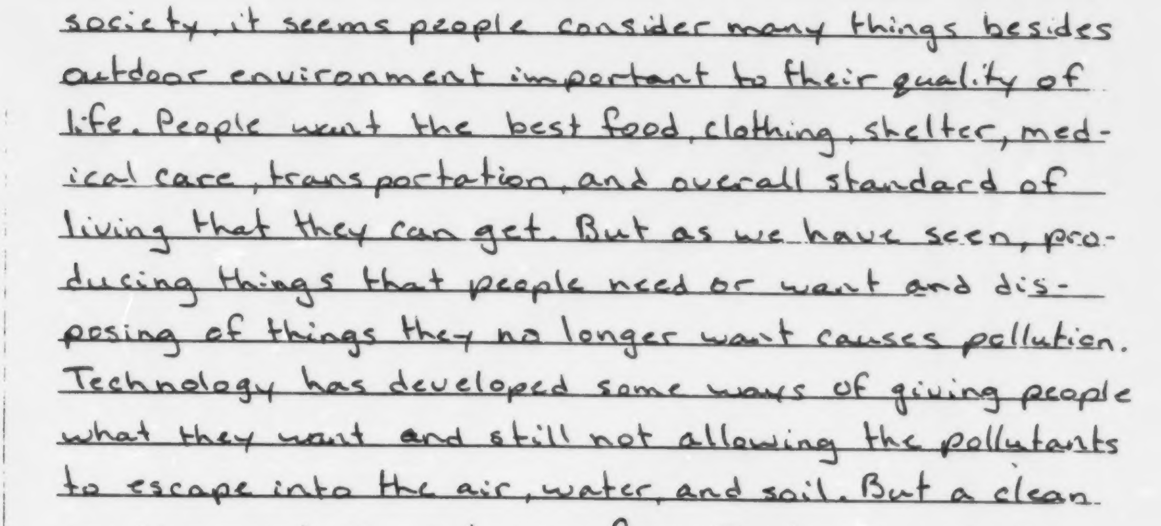
Clean Air Strategy for Alberta

Response Form

Shawn Krowski
STUDENT'S NAME
Bev Facey Composite High School
SCHOOL
Mrs. Madsen
TEACHER
12 1/2
GRADE **DATE**

To the Minister of Environment

The quality of your life and the lives of your children will depend to a large extent on the quality of the environment. What kind of environment would you like to have around you? In our society, it seems people consider many things besides outdoor environment important to their quality of life. People want the best food, clothing, shelter, medical care, transportation, and overall standard of living that they can get. But as we have seen, producing things that people need or want and disposing of things they no longer want causes pollution. Technology has developed some ways of giving people what they want and still not allowing the pollutants to escape into the air, water, and soil. But a clean environment is no longer free. In deciding whether new technologies will solve present problems, society



needs to consider what future problems these technologies may create. Ours is a time of rapid technological development. As a citizen of our changing, future-oriented society, you will probably face many decisions relating to the environment. Even within the next few years, some of these decisions may involve technological developments undreamed of today. In order to do your part in helping society make responsible decisions, you will need a plan of action. The following is a suggested plan that you can apply to almost any environmental issue. First - define the problem, Second - gather data, Third - evaluate data, Fourth - determine alternative solutions, Fifth - evaluate each plan, Sixth - select best plan, Seventh - put plan into operation, Eighth - evaluate plan as it is being attempted.

I would like to thank you in reading my solution and sugestion on the environmental issue at hand, and I hope to see my plan be used in solving your problems.

Concerned Citizen,

Clean Air Strategy for Alberta

Response Form

Dean Letinsky
STUDENT'S NAME

Bev Facey Composite High
SCHOOL

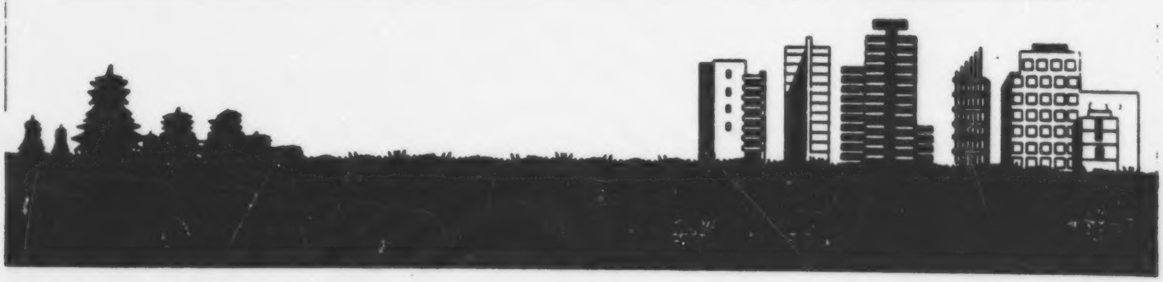
Mr. Maden
TEACHER

11
GRADE

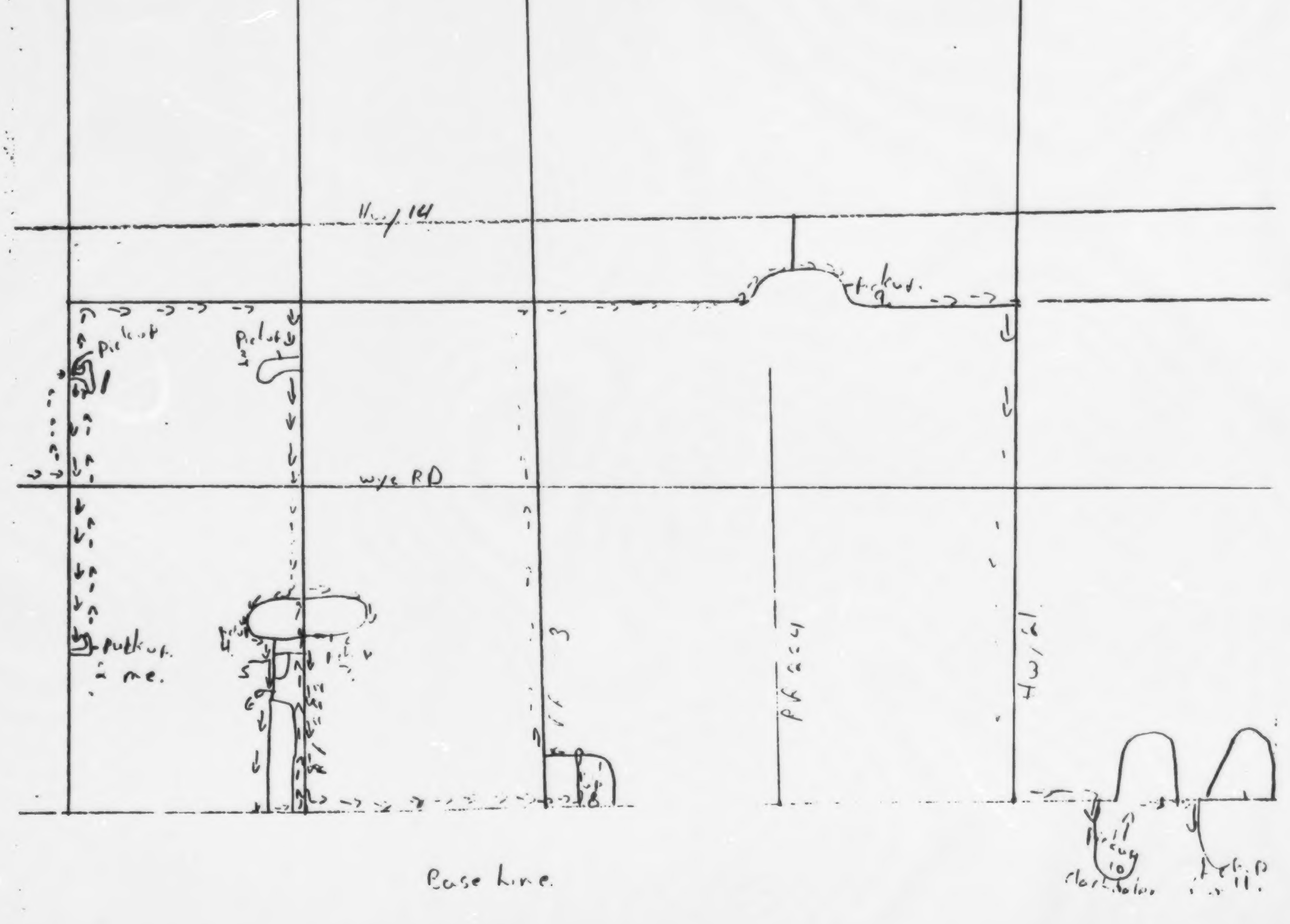
January 17 1991
DATE

Transportation

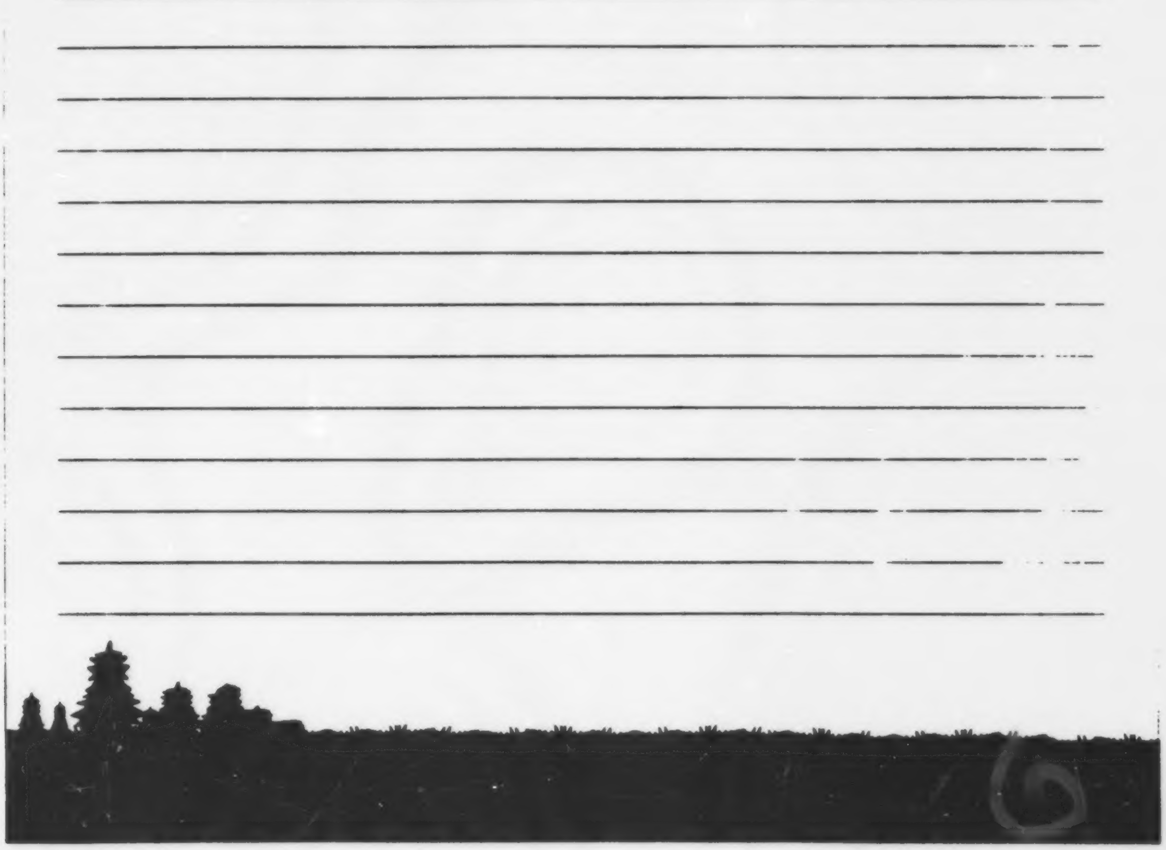
I am a student in the County of Strathcona and I was forced to ride the school bus. My Route is as such (Look at the map on the next page) Look at how much wastid travel their is. It takes me, (at the second stop) about 1 hour to get to school in the morning and back home. We are wasting so much gas picking up 1 person 15-20 miles away from school. It makes no sence when another bus goes right by their which also goes to our school. Also all the school buses should be converted to propane because propane burns at a lower temperature, and doesn't pollute as much as gas. Also we should be able to make a propane tank that can withstand the pressure from under ground parking.



My Bus Route


Hwy 14
Wye RD
Base Line
pickup 1
pickup 2
pickup 3
pickup 4
5
6
pickup 7
8
pickup 9
pickup 10
pickup 11
pickup me.
PR 224
Hwy 31
[illegible]

P.S. Mr. Environmentalist, i think you are an idiot thinking that the world will last alittle bit longer without you doing enything. And don't tell me that you know what you are doing because you don't. And you will not listen to the people of Alberta at all do you.



Clean Air Strategy for Alberta

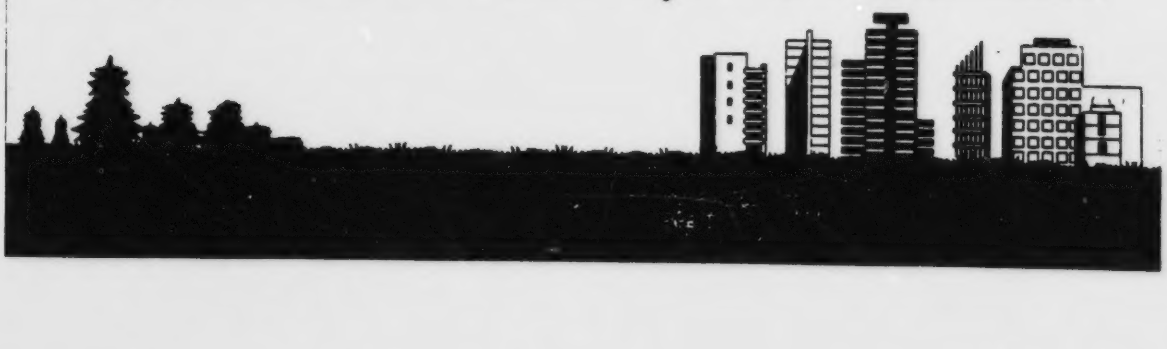
Response Form

Dave Norris
STUDENT'S NAME
Ben Fusey Composite High
SCHOOL
Mrs. Madsen
TEACHER
11
GRADE
January 17/90
DATE

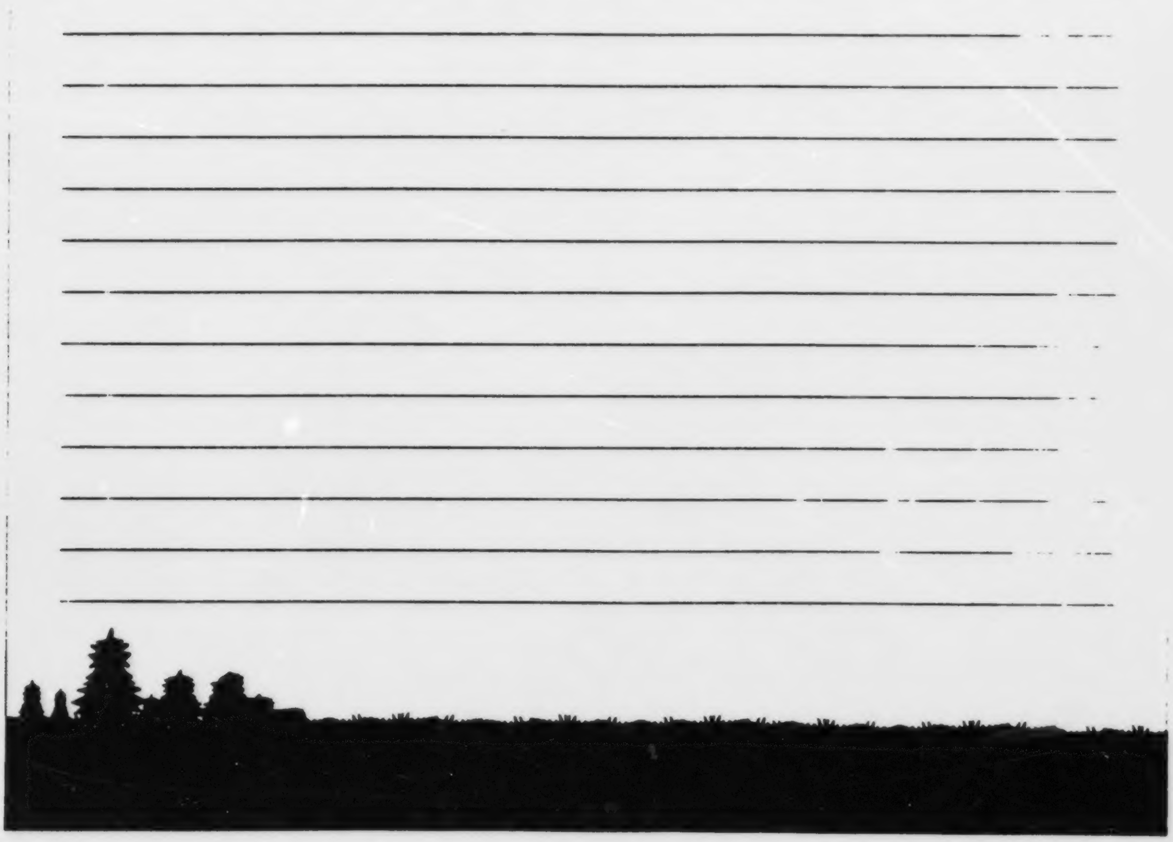
Transportation

Our transportation creates a lot of carbon monoxide and brents ~~in~~ smog in the city. There are catalytic converters to burn the excess carbon. but it only works at ~~sp~~ specific temperatures.

Another way of trying not to burn so ~~[illegible]~~ much carbon dioxide is propane. Propane burns clean and is better on the environment. The people who converts there automobile should get the conversion from gas to propane free or half price. The price on the propane at the pump should be cheaper also. The power you lose and



not being able to put the automotie in shops are reasons people don't convert. If you give more advantages like cheap fuel and conversions and make safe tanks for propane. ~~Th~~ This step will insure ~~so~~ loss of polution and clean air for ~~th~~ the enviornment.



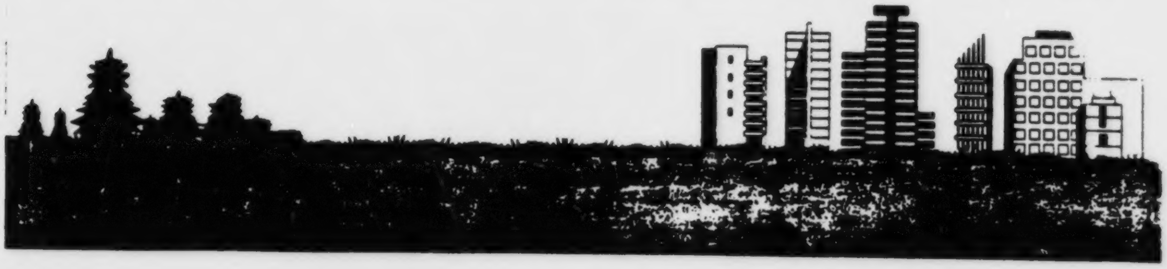
Clean Air Strategy for Alberta

Response Form

Jen Seghers
STUDENTS NAME
Bev Facey Composite High School
SCHOOL
Mrs Madsen
TEACHER
Eleven
GRADE
Jan. 17, 1991
DATE

TRANSPORTATION

I'm a student in the county of strathcona attending Bev Facey Composite High school. I get a ride with three of my friends in the car everyday. We are saving money and not polluting the air as much by car pooling. I think that car pooling should be put in affect. Car pooling is a good way to stop polluting the air, and save money. People who car pool, many people think, should get free parking or half price downtown, less charge on insurance and more support from the government. If everyday, four people drive in one car, the amount of pollution would go down. Our environment is important to us. We care about where we live and what it looks like and what goes on in the environment. The environment would be a better place if everyone could ride the bus to school and to



work but the bus systems do not run around every area in Sherwood Park and Edmonton. People who live near others who work or go to school with them should volunteer for car pooling. I think a voluteer program should be organized in Edmonton for people who agree with car pooling. Our environment is being affected by the gases, nitrogen oxides and sulfur dioxides, that comes out of the cars. We care about our environment. We have to live in it. All the pollution that goes into the air from factories does enough damage. Cars don't need to add to the disaster. Most people just drive by themselves, when there are lots who would car pool. I think this is a good decision to make. A volenteer program in Edmonton would be one wise thing to do.

P.S. Please recycle this paper.

Clean Air Strategy for Alberta

Response Form

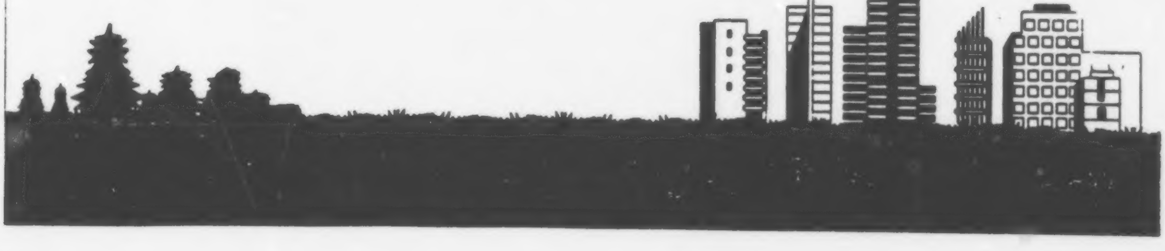
GOLDIE SITES
STUDENT'S NAME
BEV FACEY COMPOSITE HIGH SCHOOL
SCHOOL
MRS. MADSEN
TEACHER
ELEVEN JANUARY 17, 1991
GRADE **DATE**

I AM A HIGH SCHOOL STUDENT WHO HAS TO USE A WHEELCHAIR. I HAVE TO TAKE A SPECIAL BUS TO ACCOMODATE THIS

THE PROBLEM IS THAT I HAVE TO SPEND TOO MUCH TIME ON THE BUS. A CAR RIDE TO SCHOOL WOULD CONSIST OF 20 MINUTES. THE MORNING BUS RIDE IS 20 MINUTES BUT THE AFTERNOON RIDE IS ONE HOUR AND 15 MINUTES

THE LONG BUS RIDE PRODUCES AIR POLUTION THROUGH ENGINE EMISSIONS SUCH AS CO_2, CO AND NO_x. THE BUS IS OFTEN JUST SITTING WAITING WITH THE ENGINE RUNNING.

MY SUGGESTIONS WOULD BE TO MAKE ALL BUSES RUN ON PROPANE, MAKE PROPANE MORE ACCESSABLE. USE CATALYTIC CONVERTERS AND RECYCLE OIL. REVAMP THE BUS ROUTES, TO SAVE TIME HAVE ALL BUSES MEET AT



A TRASFER POINT THE DELIVER TO THE APPROPRIATE SCHOOLS. HAVE A SPARE BUS, WITH A RAMP, IN CASE OF BREAK DOWN. WHEN THE BUS BREAKS DOWN, PARENTS HAVE TO DRIVE THEIR CHILDREN TO SCHOOL AS WHEEL CHAIRS WON'T FIT ON REGULAR BUSES. ALSO, MORE OF THE EXISTING BUSES SHOULD BE EQUIPPED WITH WHEELCHAIR RAMPS SO THAT ALL STUDENTS ON THE ROUTE CAN BE INTEGRATED INSTEAD OF SENDING OUT A SPECIAL BUS TO ACCOMODATE THE STUDENT IN A WHEELCHAIR.

Goldesites

Clean Air Strategy for Alberta

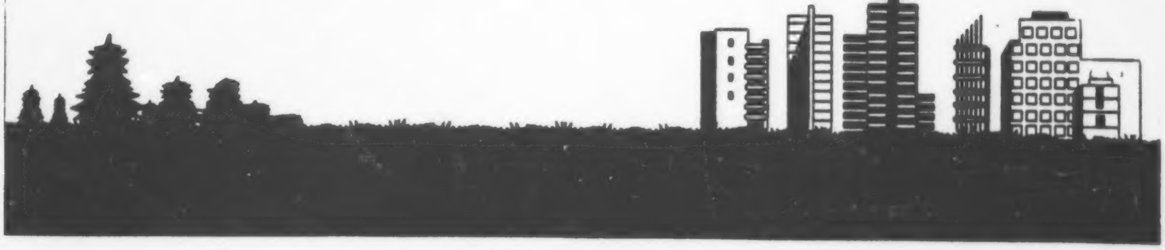
Response Form

Tim Brydon
STUDENT'S NAME

SCHOOL Bev Facey Composite High School
TEACHER Mrs. Madson
GRADE 12
DATE Jan 18

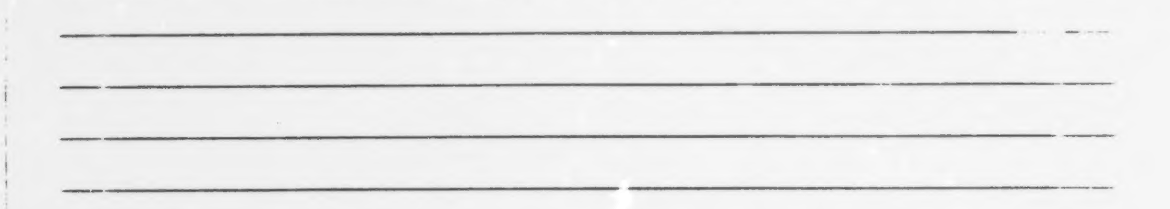
As you can see I am writing to you not on something congradulating but on telling you a big problem which I, a grade 12 even knows what is going to happen to this world unless some improvements will be made.

To begion with why don't you invest in some high speed trains which will save people from driving their cars polluting the air with CO_2. Why not cut down on CO_2, and railways going to Calgary and places which are close together



will help. If you don't believe that many people will drive, I don't see why not. It will be a lot faster to work and a lot faster going home. It could help for kids going to school. and people or moms going to shopping centers.

Why not splurge a bit and save our environment.



Clean Air Strategy for Alberta

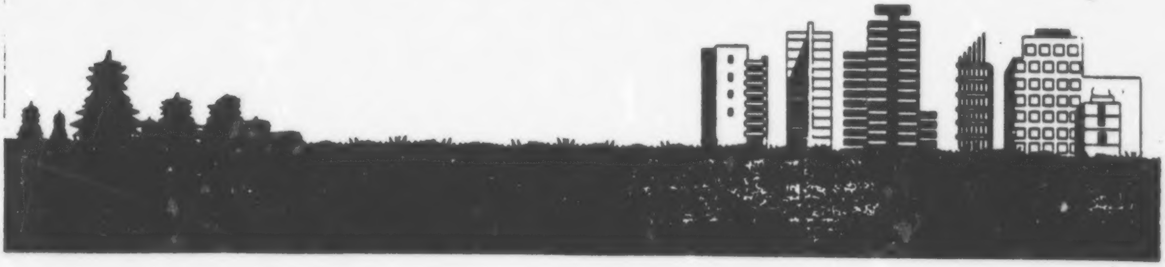
Response Form

Corey Hagstrom
STUDENT'S NAME
Bev Facey
SCHOOL
Mrs. Madsen
TEACHER
10
GRADE
Jan 17, 1990
DATE

Recyling:

Mr. Klein you are so cheap that you have 47 schools doing recycling and you make student take the paper rather then spending some money on a truck that picks up the paper. Another thing why don't you go back to school and learn a few things about the environment.

Their are a lot of things that you could do to help the environment like stop double packaging. On Old dutch chips they have a plastic bag holding the chips and also a box over that do you think we have to have a carring case to hold the bags. thats a waste of cardboard. Why can't they put the brand name on the bag instead of the box. Toothpaste is another waste of cardboard why have a box to carry that. The brand name is on the bottle why



have it on the box again.

Every home should be into recycling and be forced to recycle. A family produces a ton of garbage a year. If you recycled the paper the garbage would be cut in half. telephone books should be given to AGT to be recycled and if a person doesn't he/she should be fined.

Bottles, cans can be recycled. Some people do recycling and the people who do put them in the bins the areas suppl. The people who don't still throw them out. Mr Klein you should make a law that if you don't throw your cans or bottles in one of the bins you will be fined. Also the bins should be placed in more places.

Overall I think you have enough power to do all these things I have listed. If all the people help out in the environment The air, land and The whole world would be much cleaner. If you don't do any of these things I think it would be appriate to quit and hire someone who will do semthing about the environment.

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME: Chris McIntyre

SCHOOL: Bev Facey

TEACHER: Mrs. Madsen

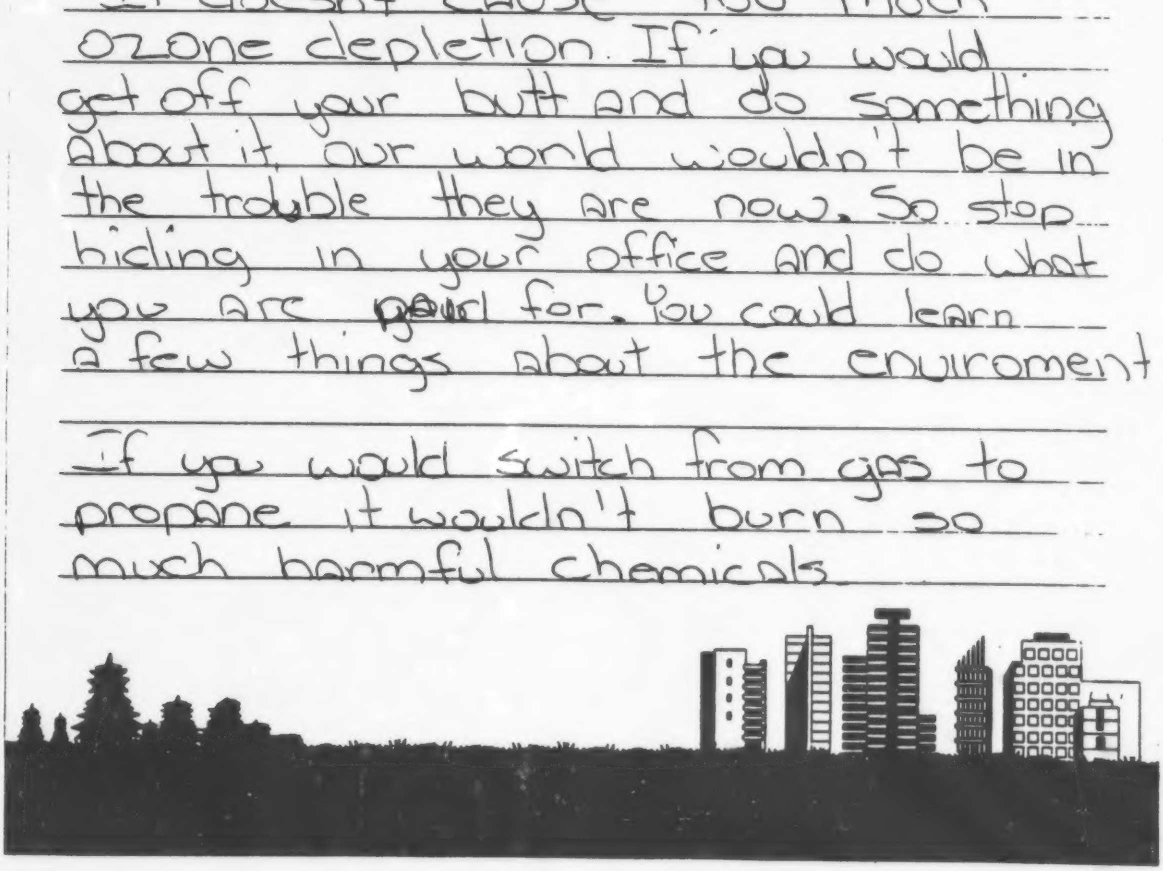
GRADE: Grade 10

DATE: Jan 17/91

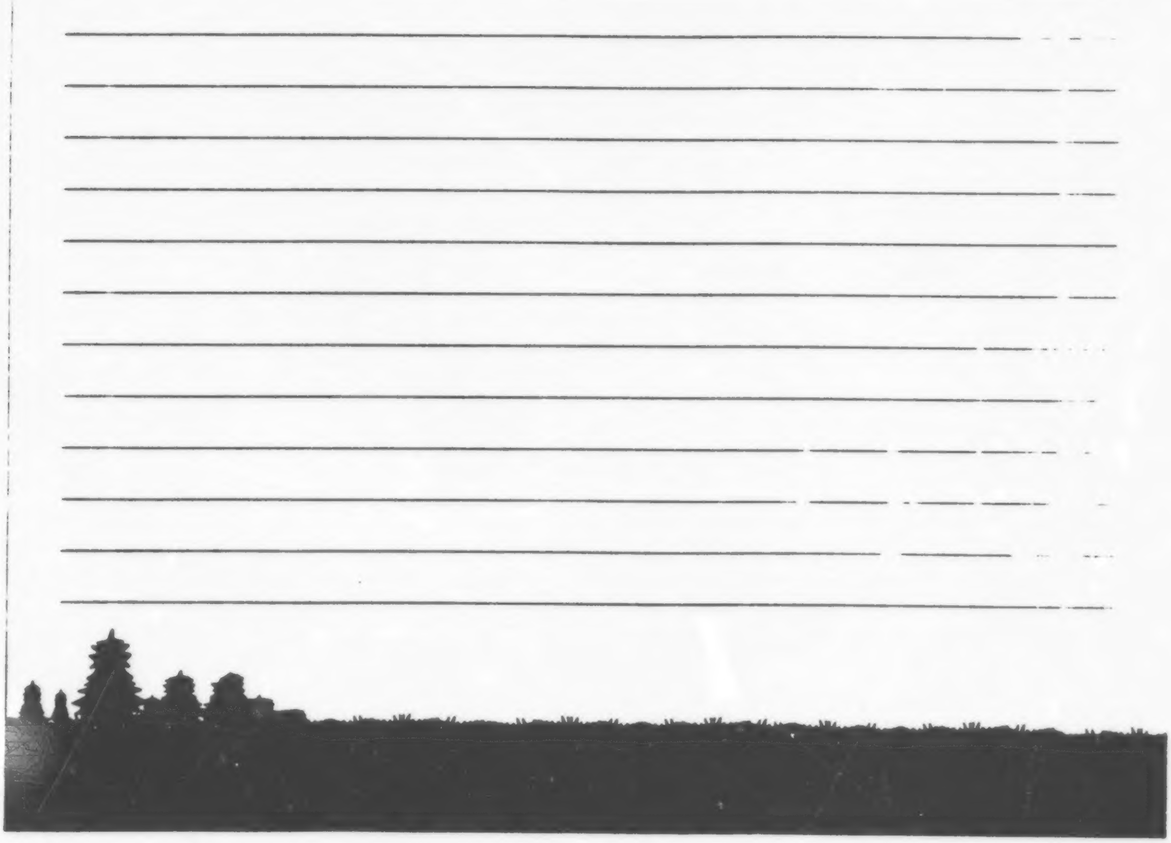
To Mr Klein, I think you should switch all of the vehicles to propane. Propane is a clean burning. It is also cheap. Another propane lasts longer.

It doesn't cause too much ozone depletion. If you would get off your butt and do something about it, our world wouldn't be in the trouble they are now. So stop hiding in your office and do what you are paid for. You could learn a few things about the enviroment

If you would switch from gas to propane it wouldn't burn so much harmful chemicals



Propane would be a great idea, people would save alot of money. The air would be alot more cleanier. I hope you will take the time and think about this and other issues of the enviroment. Start thinking of it now, rather than later.

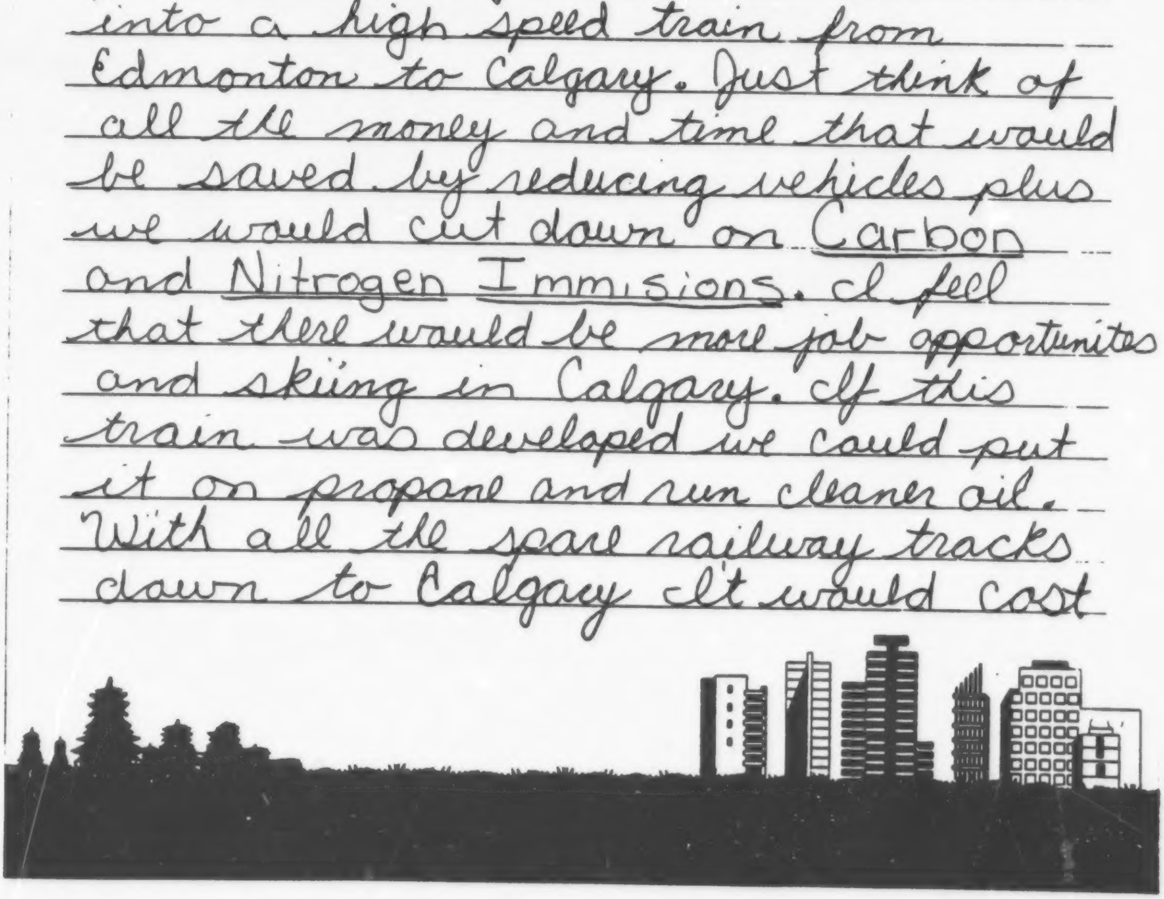


Clean Air Strategy for Alberta

Response Form

Steven Lawrence
STUDENT'S NAME
Bev Facey High School
SCHOOL
Mrs. Madsen
TEACHER
Eleven
GRADE
DATE January 17, 1991

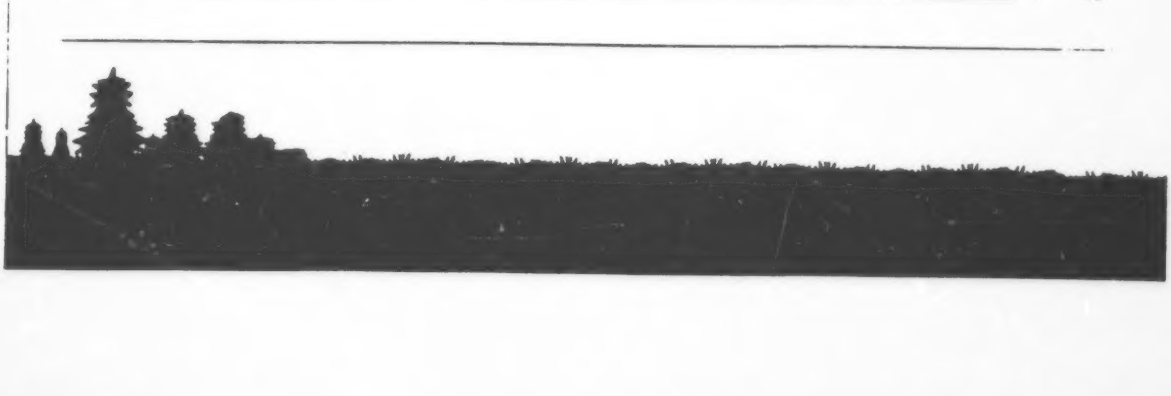
I am a student who attends Bev Facey High School. I am very concerned with our environment. I feel that the government should look into a high speed train from Edmonton to Calgary. Just think of all the money and time that would be saved by reducing vehicles plus we would cut down on Carbon and Nitrogen Immisions. I feel that there would be more job opportunites and skiing in Calgary. If this train was developed we could put it on propane and run cleaner oil. With all the spare railway tracks down to Calgary It would cost



pennies to build. With these pollutants we are destroying our enviornment, creating acid rain and we are enforcing to Global warming. This could be slowed down or maybe stopped if we took action right now. So take this letter serious and do something about it. Also Recycle this letter. (save a tree)

P.S To the Minister of Enviornment R. Klein, I feel that you are selfish and greedy and don't take enviornment situations into consideration. Why don't you get out of the government and let a real enviornmentalis take your place.

Concerned
Student!



Clean Air Strategy for Alberta

Response Form

Ashley Godwin
STUDENT'S NAME

Bev Facey
SCHOOL

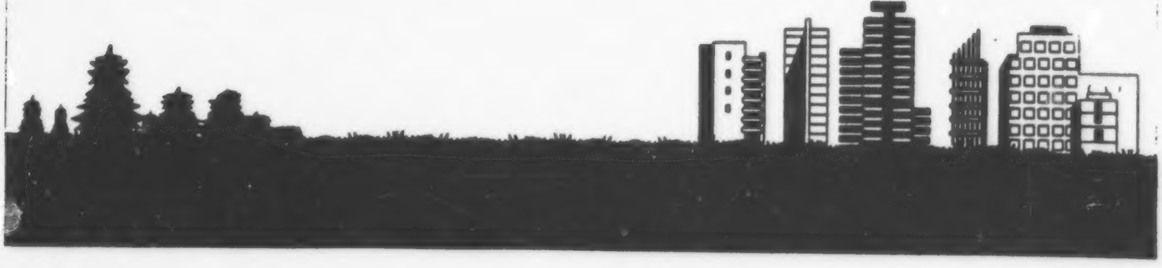
Mrs. Madsen
TEACHER

12
GRADE

January 17/91
DATE

Well hello Ralph Klein I am a concerned citizen, with problems about our enviroment. There is one issue I would like to cover in this particular letter and that their is Solar heating and how it helps our environment. I would like to explain to you why this concerns me so. Now let me make an educated hypothesis your house is probably heated by a natural gas burning furnace which let's sulfur emmission's into the air and by burning oxygen let's of Carbon Monoxide. which lead and helps global warming by collecting and building up in the ozone layer. Which delete's the greenhouse effect by not letting the light reflection back into space.

Now if we could get at least 60% of home builder's to put in solar heating, the



air we breathed in would be that much better. And how do we get home builder's to do this, we give them incentives, lower pricing of solar heating, pay them, there are so many things the goverment could do to help the enviroment but you seem to keep on taking it for granted and soon time is going to run out. Were all trying to do our bit now it's your turn to help us by educating us more on the major and minor issues. Now me and 12 other classmates of mine have sent in letters please take each one seriously.

Concerned citicen,

Ashley Goodwin

P.S. I would like to see you get off your fat fanny and go outside and see what is realiy going on. Please for the world's sake let someone who cares and know's what their doing take over.

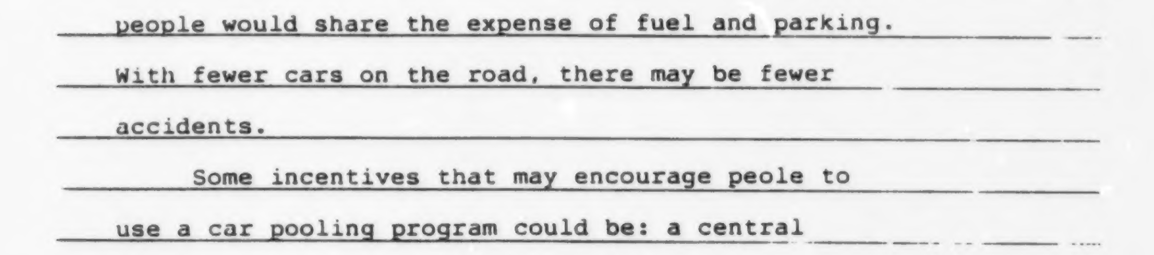
Clean Air Strategy for Alberta

Response Form

Glen Crawford
STUDENT'S NAME
BEV FACEY COMPOSITE HIGH SCHOOL
SCHOOL
Mrs. C. Madsen
TEACHER
10 Jan 17 91
GRADE **DATE**

Car pooling is a very good idea;it would cut down on the number of people on the road during rush hours. It would reduce pollution and gas and oil consumption. It would relieve parking problems in central areas. It would be more convenient and economical because people would share the expense of fuel and parking. With fewer cars on the road, there may be fewer accidents.

Some incentives that may encourage peole to use a car pooling program could be: a central registry to match people for destinations and departure times; a single express lane for vehicles with four or more adults; a special card for reduced gas prices for reduced parking prices in the core area during business hours; the use of vacant church parking lots for park and ride meetings.



As things stand today, these suggestions are choices-however, in the face of the world crises these suggestions may soon be realities.

Thank you for your consideration of this letter

Yours Sincerely

Glen Crawford

Clean Air Strategy for Alberta

Response Form

Cote Srach
STUDENT'S NAME

Newberry
SCHOOL

Mr. Hans
TEACHER

9
GRADE

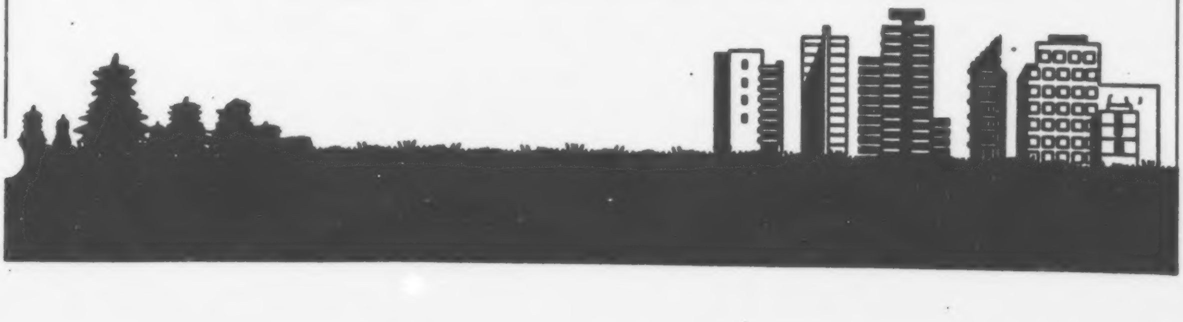
Jan. 11
DATE

The Green House effect.

The Government could work a little harder on it and try to find cheaper and easier ways to clean up the enviroment. Have people help, by not driving in one in a car but drive in groups. In winter have electric heater not furnaces. Have the logging companies stop cutting down good trees and take old tree's and replant new trees, or just take the good, good tree's and leave the tree's they don't want in steed of clear cutting.

Sulpher Oxides.

The government should look into getting better standards of preventing sour gas well from leaking out these fumes. Every year we hear of a sour gas well that has giving a leak. People have to be evacuated real quick. Government must find a better solution to prevent there leaks from happening because farmers will not be able to grow good crops, trees will die and people will be sick.



Methane

We must learn to avoid so much garbage and litter. Our country has very much waste and the government is trying to establish ways like hauling our garbage to Kitscoty dump. This will help prevent some poisonous gases from getting into the air. Otherwise if there is a garbage dump in every town then with burning these is much Methane Hydrocarbons released into the air. There is a need for better equipment and process changes. There is a need for recycling and have less land fills.

Nitrogen Oxides

Our oil industry must find a means of controlling the burning of fuels. There should be monitors to record. How much nitrogen oxides are released and if they are over the limit there should be something done to curtail the amount of fumes or oxides released. They must invent other options such as maybe building cars that could run on something other than gas.

Chloroflouro Carbons and Halons

I think the government in this situation is doing as much as possible. As for hair sprays, deodorants etc. They must manufacture some other solutions that are not so powerful or potent and not as harmful to the atmosphere.

Energy Efficiency

I think that the government could be finding a better substance to use for Energy and is not harmful to the atmosphere. If they can't find any thing better cut down of the Energy by finding a way to cut the energy a place would use in a day to have it the they would use that in about a mounth.

Volatile Organic Compounds

The government should find a better solution for explosives, and harmfull gases. So that when they exploded and don't harm the invironment. e.g. dynamite take out all the things in it but keep the strike and put a gun sheel in the dynamite and have an igniter. And make law up that if they pollute the river make it a \$100,000 fine

Acid Deposition (Acid Rain)

I think that the government should stop letting factories being but, they should find a better way to clean the smoke that comes out, and all the Garabage that is through into lakes and rivers, by having them clean the things to clean it all. Find a better thing for cars that aren't harmful to the Environment.

Carban Dioxide (co_2)

I think that the government should try and have companies cut down on the neddstant like burning of fossil fuels

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Art Parr

SCHOOL Dewberry

TEACHER Blair Hanna

GRADE 9

DATE Jan 13, 1991

Dear. Mr Getty

These are my suggestions for a Clean Air Strategy for Alberta.

1. A substitiste for fossil fuels would cut down the emissions of Nitrogen Oxides and Volative Organic Compounds. A substitute for fossils fuels could be Methane because it very flamcable.

2. Government could provide insentive to people who install solar heat in their homes.

3. Provide cheap public transporation which would cut down on the vehicles on the road. Enforce car manufactors to use most efficient carburators.

4. CFC's should be banned 100% right now. Coolants for refrigerator and air conditioning should be substituted

5. Higher fines for industrial factories ~~emitted~~ emitting expessive amounts of pollutants into atmosphere.

I will be impossible to eliminate all polutants but any attempt is a help to the atmospher

Clean Air Strategy for Alberta

Response Form

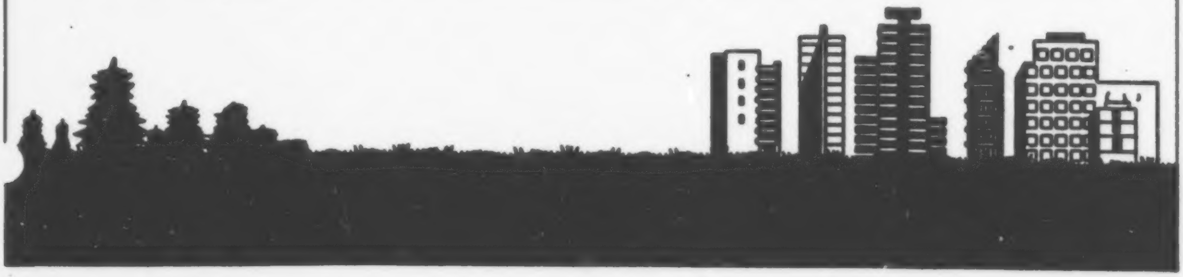
Angie McVeety
STUDENT'S NAME

NewBerry School
SCHOOL

MR. Blair Hanna
TEACHER

nine
GRADE

Jan. 11, 1991
DATE



When I was looking at you chart on Methane Emissions and I don't understand why the Bio-mass burning is so high. We destroying our forest everyday!

Why can't we cut down on our emissions of nitrogen oxides by 3% that would bring it down to 36% and do it again in 5 years time!

Why do we have to use Chlorofluorocarbons (CFC's), we should use paper in stead of styro-foam! Paper is recycleable. Why not bring the %age down by 20% in 2 to 5 years?

Energy is very important but can't we use recycleable energy?

Acid rain kills lakes and rivers. Why doesn't the government, make a company or major companies help to reduce acid rain?

As you may or maynot know already, many people including myself are worried about the earth and the enviroment. I have been given readeing on some of these pollutants and I am very shocked that the government has badly or so I think the government should have done more. I had thought that the government had done more about saving our planet for generations to come. I hope I can give you some helpful hints!

Why doesn't the government try to do more things? For example:

Why not try to cut sulpher dioxide emissions in half? Sour gas plants emissions account for 38%, oil sands 29% and coal-fixed power plants 16%, why not try to cut down by 5 to 10 % every 2-3 years? If we don't do these things we will sooner than later we will have the effects! The effects are going to damage our society by having irrated throat, lungs and the fine dust particles in the air, damages a persons respiratory system. Due to the polluting by year 2000 we will be the highest promoting province in Canada.

Methane is another chemical that is harmful to the environment. Methane is produced by the breakdown of plants in landfills, swamps and marshes. However it is also found in oil, gas, and coal deposits, when we are burning these fuels we are damaging the ozone layer

Due to the ozone being destroyed we are warming the earth causing drought throughtout the world. We are adding to the problem!! If we don't stop, we will suffer badly! I want to live in a clean enviroment. Most people don't even think about what they throw away. I don't want to live in the world if all we going pollute it more and more every year. I hope my questions and ideas are helpful and I hope we can do more because it is up to us to do something!

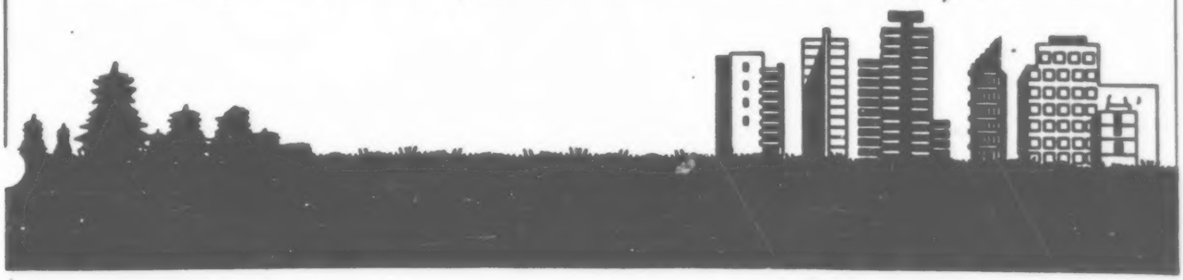
Clean Air Strategy for Alberta

Response Form

Matt Hodson
STUDENT'S NAME
Dewberry Alta
SCHOOL
McHanne
TEACHER
9
GRADE
Jan
DATE

In regards to the greenhouse effect, the government should be notified if a company or industry or even if a rural farmer will be burning plants of big numbers ex) burning of the rainforests). You see now that the more plant's burned in time there will be a rise in temperature Even though the rise in tempature would be small, it could be fatal in the future.

They say that Alberta's emmisions of sulphur dioxide is 15 percent of Canada's emissions. Now, if the



government could reduce the sulphur dioxide from 15 precent to 10% or lower within the next 10 years. Sulphur dioxide as well as Nitrogen and Methane are produced by the burning and processing of fossil fuels. So what I think should be done is to monitor more factories which produce sulphur dioxide, nitrogen oxides and methane, especially sour gas plants which produces 38% of the sulphur dioxide released into the air. The more sulphur dioxide released into the air the worse it is for the crops and other plants, textiles, building materials rates and for animals and people.

By the year 200 CFC's should be totally band from house hold use and substitutes that are chemically related to reduce the chance of ozone depletion.

Industries, schools and buisness's should be more energy efficient in concerns of saving money in the future. The department of Energy should enforce their ideas in the residentail areas and commercail/ Institutional areas by studying how many people are really energy effiaint.

In regards to Volatile Organic Compounds the government should have it that rural people should purchase their gasoline at the pumps so that the gasoline isn't being transfered from the bulk station to the homes in the country. By doing this less gas evaporation would occur. People should switch from fossil fuels to ethanol gasoline.

For Acid deposition the government could raise the price of fertilyzers, cement, chemicals and pulp and paper industries. We must remember, a lot of Acid deposition comes from the States.

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Marilyn Holmen

SCHOOL Dewberry School

TEACHER Mr. B Hanna

GRADE Nine

DATE January 14, 1991

In order to ensure that life will be able to continue on the planet Earth, several things could and must be done to preserve our wonderful home. As they say, "It's a beautiful home, but we all have to do the housework."

There used to be, in my home town of Dewberry, a box in which we collected paper for recycling. Our community was very supportive of this 'recycle box' and it was always full of newspapers, magazines, even scrap paper. Because of the increased transportation costs and loss of market, this program was shut down. Now all that waste paper ends up in the local dump.

In the fact sheet entitled "Sulphur Oxides" under the subheading 'What has been done so far' it states that sulphur recovery requirements are not applied to existing plants unless they expand by more that 25%. Why don't existing plants have to recover the extra sulphur?

Under the subheading 'What has been done so far?' in the fact sheet named 'Chlorofluorocarbons (CFCs) and Halons' it says that Canada was prepared to end their use of chlorofluorocarbons and halons by 1997. Nineteen ninety-seven is still six years away. CFCs and halons have a lifespan of 60 to 110 years in the atmosphere. That means they will still be in the atmosphere in 2107. The sooner all countries end the use of CFCs and halons, the sooner we are united in the prevention of the depletion of the ozone layer.

Packaging provides a lot of extra materials that just end up in landfills. I think more stores should sell in bulk and give refills for a lower price to encourage shoppers to buy reusable containers. Stores like Nutters in Lloydminster, sell all types of food in bulk. A person can buy as much of the product as needed, and the only packaging they get is one little plastic bag that can be reused. Other stores like Safeway, encourage returning shopping bags for recycling and/or reuse, and also sell a type of cloth shopping bags to use over and over whether in that store or other stores. Another solution is people would likely reuse shopping bags if they had to pay extra for them. In addition to this, the squarer the box, the more product you get for less packaging. Yet, most cereal boxes etc., are rectangular.

Styrofoam packaging should be replaced with other forms of material, for example popped popcorn. Some companies have switched to popcorn and I think its great! Popcorn is just as light as styrofoam packaging, but it contains one major advantage, it is biodegradable.

Sulphur dioxide is used in the preparation and preservation of fruit, yet it can harm crops and trees, even people. Isn't there a better substance that will substitute sulphur dioxide, but serve the same purpose?

In Edmonton, and other cities and towns, there is a recycling program called Blue Box. I really support that program and wish we had a similar program in Dewberry. There should soon be a Blue Box program in our major shopping center Lloydminster. Even though Blue Box only recovers approximately 25% of wastes that would otherwise end up in a landfill, every little bit counts.

Many companies have recently gone "green". I think the Alberta Government should support environmentally conscious industries and products, and convince other industries to change their procedures to help save the environment.

I think more people would rely on public transit if it appeared more attractive to them, and was more readily available in smaller cities. When a person takes a taxi, they may as well be driving themselves. Sharing a taxi is much more fuel efficient. A public bus or subway takes a lot more people for the same amount of fuel expended. And make sure we keep looking for a replacement for fossil fuels in the automobile.

Solar power, hydro power and the power generated from the wind is a lot more environmentally friendly than power generated from the burning of fossil fuels. Why not try to use it more often?

Often when driving down the road, there are containers which at one time held chemicals like sprays for crops etc. in the ditch, in water sources like dugouts etc., and in dumps. I think chemical companies should be legislated to reuse containers. They could impose a container deposit which would encourage people to return the spray cans to be reused. Places like grain elevators could collect the cans and supply a refund.

If there was a cash incentive involved, I think more farmers would set leave a certain amount of marginal land untouched, as a wildlife habitat. Marshy areas not only provide breeding grounds for wildlife, but act as surface water collecting areas to replenish ground water reserves. Yet farmers are draining sloughs and breaking up marginal land at an alarming rate.

Over the past few years, we, as a society have become wasteful and negligent. We must change our ways in order to preserve and better the life on earth now, and for the future. We have left it too long already, and if we wait much longer, it will have become too late.

Clean Air Strategy for Alberta

Response Form

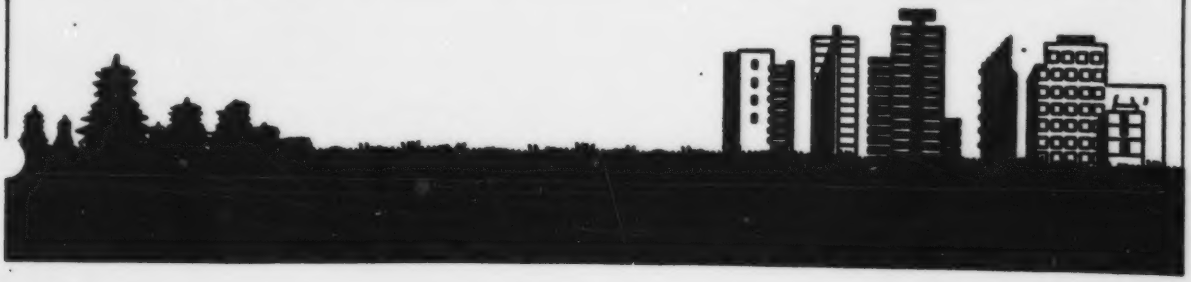
Shannon Braithwaite
STUDENT'S NAME

Dewberry
SCHOOL

Mr. Hanna
TEACHER

Nine
GRADE

Jan. 15, 1991
DATE



Dear Mr. Getty,

Lately in my Environmental Studies class it has been further brought to my attention of the grave danger the environment is actually in. Although some has been done to help preserve it. I feel much, much more must be done in the immediate future or we all will have to face the horrendous consequences. As an Alberta citizen I am trying to do my part as everyone should, but as the premier of this province you also have a direct responsibility to us, the people, to take into consideration the condition of the environment now and in the future.

Everything the government is doing, is helping, but if more was done sooner wouldn't it make a considerable difference? For instance if instead of waiting until the year 1997 to have chlorofluorocarbons totally phased out. An earlier date should be set because with the time limit as is chlorofluorocarbons will still remain in the atmosphere in the year 3007. A earlier banning of chlorofluorocarbons would stop people abruptly. Without these products people would be forced to find substitutes which could be used instead and people using these products would find out as much or more as the reseachers that you, the government have paid to look for products to replace chlorofluorocarbons after there depletion. Since most people will find replacements if a pressure situation should occur. If banning cannot happen as quickly as I have proposed, then heavier restrictions should be made and if not followed, stricter penalties should apply. In the instance of the penalty, ~~of~~ money ~~it~~ should go to an Environmental Fund and then put to good use.

Another main problem is the fact of the greenhouse effect, although a natural ongoing problem that all humans that breath are guilty of contributing to. Man made emissions are greatly to blame for the increasing amount of greenhouse gases escaping into the atmosphere. These gases trap heat released from the Earths surface and are causing global warming and much drought. My question is that if this problem was first recognized in the early 1800's and then at the beginning of this century it was estimated to have doubled or tripled over this time period then why wasn't action taken sooner? And why at such a slow pace after action was starting to take place? Many thing can begin to start happening now that will help the environment survive a lot longer. My suggestions are to stop the burning of the rain forests or any other heavily wooded areas, start cutting down on the amount of fossil fuels used, have convenient recycling places and support projects like the blue box program.

Naturally vocanoes, bacteria and vegetation are volatile organic compounds that harm the environment, but fossil fuels are also a major source or volatile organic compounds.

These volatile organic compounds are a threat to human life and Alberta is the fourth largest volatile organic compound emitting province in Canada. The most common man made sources of this are motor vehicles, photochemical processes, and the use of solvents. In the area of solving this problem alot can be done, but isn't. The dominant reason is obviously, money, but something must be done and now, no matter what the cost. As the government you should put stricter restrictions on the use of fossil fuels, people and companies for starters could organize car pools, and in larger centers buses should be promoted for use instead of taxis to minimalize amount of carbon dioxide pumped into the air.

I realize all of these problems can't be solved over night and maybe you have already discovered all the ideas I have suggested, but I hope you understand and make others aware of the condition that the environment we live in, is actually in and I hope that everyone understands that although restrictions may cause inconviences and a change in our daily lifestyle they must be taken or we will all pay for the mistakes we've made now...in the very near future.

Yours Truly,
Shannon Braithwaite
Shannon Braithwaite

Clean Air Strategy for Alberta

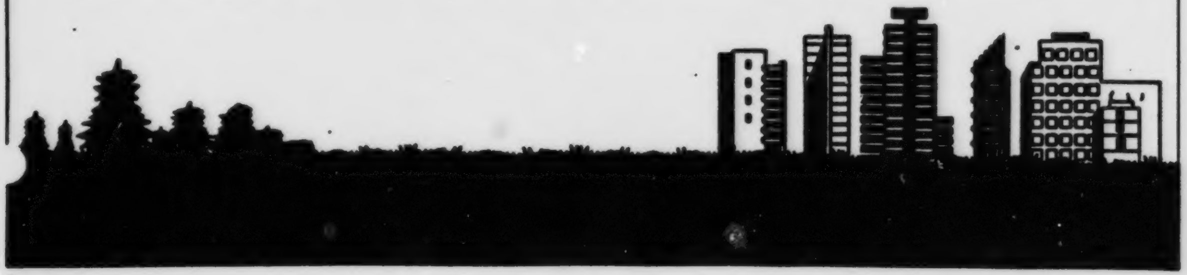
Response Form

STUDENT'S NAME Marty Butz

SCHOOL Dewberry School

TEACHER Mr. Kanna

GRADE 9 **DATE** January 14, 1991



THE GREENHOUSE EFFECT

I think that the Greenhouse Effect can be reduced drastically if the following conditions take place:

1. the burning of the Rainforests are completely stopped. (the burning produces carbon dioxide which is a gas that increases Greenhouse Effect)
2. poeple should make changes in their lifestyle and make substitutions so that the Greenhouse Effect can be delt with.
3. Decrease the emission of Methane, which is a gas that increases Greenhouse Effect, by traveling more efficiently, have standards on vehicles so incomplete burning does not occur, and be much more careful on the production of fossil fuels.
4. instead of just having a meeting in 2002, why not make a decision immediately. The longer we wait the worse it will get.
5. decrease the amount of Nitrous oxides, which is a Greenhouse gas, by following the information I have already given on Nitrogen Oxides.
6. decrease the amount of chloroflurocarbons, which is a Greenhouse gas, by not manufacturing them at all. I feel with a little change in the lifestyle, people can live without CFC's. I think it would be worth the change.

SULPHUR OXIDES

Sulphur Oxides can be reduced if industrial processes such as chemical preparation, refining, pulp making and solvent extraction can some how be substituted. If not these things must be delt with by decreasing the industrial process. Sulphur Oxides also needs a substitute for food preservation. In other words another substance must be found that prevents bacterial growth. Also sour gas plants must be made so no emition of Sulphur Oxides takes place, oil sands must be made safer, find a substitute for coal or decrease the amount of coal that can be used, fossil fuel processing must be made so that no or little Sulpher Oxides is released. example: travel more efficiently, find substitutes for fossil fuels if possible.

METHANE

Methane will be reduced if the VOC's are reduced.

NITROGEN OXIDES

In order to decrease Nitrogen emitions the temperature of engines must be kept cool some how because the higher the temperature the higher the level of Nitrogen Oxide. Fertilizer also contributes So I think prices should go up on fertilizer and I also think that people who use fertilizer should be made to follow stric~~ked~~t regulations. Oil and gas industries should be made or changed so no Nitrogen Oxide is emited. People should travel more efficiently and electrical utilities should be changed so they do not emit Nitrogen Oxide or they should be eliminated.

ENERGY EFFICIENCY

I think that the government should set aside a lot of money to people who invent substitutions for fossil fuels. example: vehicles being run by water and air while they are compressed. I think that traveling efficiently would help. Higher prices on fossil fuels may force people to do so. People living in the city traveling on electric busses would help. This would also decrease smog and other complications. Maby the government should put limits on the amount of gas a person can use. Encourage other means of travel. Example: horse, foot, peddle bike (close distances) I think the government should inform all people about the possible shortage of fossil fuels. This might help.

VOLATILE ORGANIC COMPOUNDS

To decrease VOC's Nitrogen Oxides must be reduced or eliminated because when in the presence of sunlight and Nitrogen Oxides VOC's react to form ground-level ozone which is a component of smog. Follow what I have already said about Nitrogen Oxides to control this problem. I feel this would be the best and most efficient way to deal with VOC's because they are released mainly by natural vegetation. Example: trees

ACID DEPOSITION (ACID RAIN)

Some ways of controlling Acid Rain is:

1. to eliminate or decrease Nitrogen Oxide emitions by doing what I have already said about Nitrogen Oxides.
2. Sulphur Oxides is a major contributer to Acid Rain so it must be controlled by doing what I have already said under Sulphur Oxides.
3. Controlling the Greenhouse Effect would really help because it increases Acid Rain.

OZONE-STRATOSPHERIC AND GROUND-LEVEL

Man can help this problem by:

1. decreasing or eliminating Nitrogen Dioxide because when mixed with ozone or Sulphur Dioxide injury may be caused at an even lower concentration levels.
2. Eliminating CFC's because they destroy the ozone layer in the statosphere. Methane also contributes to the destruction of ground-level ozone.

Clean Air Strategy for Alberta

Response Form

STUDENT'S NAME Kyle Jones
SCHOOL Dewberry School
TEACHER Mr. Hanna
GRADE 9 **DATE** January 11, 1991

Clean Air Strategy for Alberta

In todays world there are very many environmental concerns such as the GREENHOUSE EFFECT, CFC's, Methane, Volitile Organic Compounds, and Acid Rain.

The GREENHOUSE EFFECT is one problem that faces the lives of many people. The GREENHOUSE EFFECT is caused by a CO2 blanket which traps sunlight and as a result global warming occures. Alot of CO2 emmitions come from the burning of fossil fuels. Automobiles are one problem, that has a high co2 emmitions rate.

Scientists at the SKYTEK engineering company have been working on a new source of energy for transportation, which is non polluting. They envented the Aluminum Air Battery. The battery runs on Aluminum, salt water, and air.This battery is nonpolluting whereas gasoline is. The Canadian Engineering Company, (SKYTEK) flew a radio comtrolled plane running on the Aluminum Air battery for 41 minutes. This is proof that the battery could be later on used as a source of energy for transportation. The only draw back to this battery is that the technolohy is just not there to inexpensively massproduce the battery cheaply. I feel that the Government should make it possible for the technology to be there by giveng the Science companies Like SKYTEK, money to use it on the technology of the Battery. All of this could lead to nonpolluting transportation.

CFC's are another problem in the atmosphere and could later on have dangerous effects on our planet. The molocules of the CFC's can destroy many ozone molocules for every CFC molocule. I think that the Government should stop the use of CFC's 100 % now, rather than 85% by the year 1999. CFC's have long life span and could stay in the atmosphere for a long time. The sooner we stop the use of CFC's, the sooner we will stop the damageing of the ozone layer.

Methane is a problem related to CFC's, it breaks down ozone molocules. The molocules of Methane are 20 times more potent over a 100 year period than carbon dioxide molocules. The more ozone molocules that are destroyed the more UV (Ultra Violet) rays are going to pass through the ozone layer and there will be more cancer victoms, all because of Methane pollution and related pollutants. Methane all comes from rotting animals, incomplete burning, and a great deal comes from livestock manure. A way to prevent Methane is to make sure that people burn dead carcuses instead of letting them rot.

Volitile Organic Compounds come fom industrial process, and evaporation of gasoline. Evaporation of gasoline comes from Service stations, when filling up a car with gas some of the gasoline evaporates into the atmosphere. A way to decrease the evaporation of the gasoline is to make air tight nozzels so that the gasoline can't leak into the air while you are filling up.

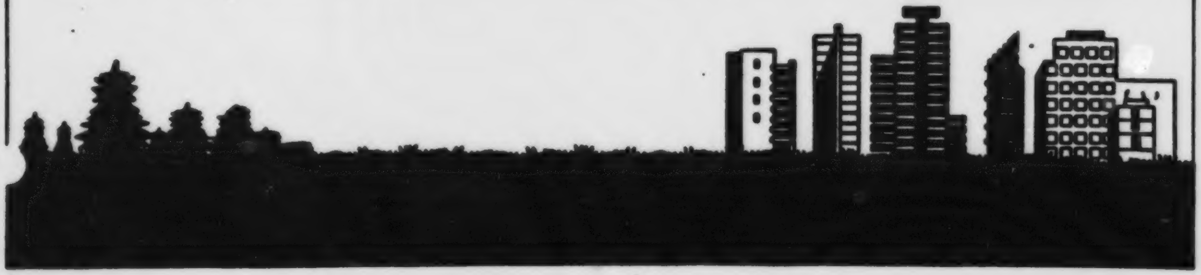
Acid Rain is very harmful to nature, it gets into lakes and kills them off. Sometimes animals drink from the acid effected lakes and die. Acid Rain comes from Sulfur Oxides mixed in with H2o. Sulfur Oxides come from natural gas processing plants, oilsands plants, and coal fired power plants. Also nitrogen Oxides come from automobiles exhaust systems and can turn into Acids which fall when mixed with water. A way in which the Government could decrease the Acid Rain content is to car pool which decreases the sulfur oxides from the automobiles which eventually will decrease the amount of Acid Rain in the atmosphere. Also do more research on how to use the left over gasses in gas processing. The Government could make very strict laws against emmiting sulfur oxides, and if the laws are broken, have a serious penalty.

If every one in world just tried to do something, not much, but somthing, to help in cleaning the air we might have a chance to live in a clean world.

Clean Air Strategy for Alberta

Response Form

Justin Crawford
STUDENT'S NAME
Dewberry
SCHOOL
Mr. Hanna
TEACHER
Grade 9
GRADE
Jan. 14, 1991
DATE



Dear Mr. Cherry;

Statistics say that man made emissions are leading to increased amounts of greenhouse gases in the atmosphere. So if man is the leading cause of the Greenhouse effect, I think that we should start doing something about it.

Companies who produce Sulphur Oxides should, in any way possible, decrease the amount of Sulpher emission. You could say to these companies that if they do not decrease this emission, in time it will be a disadvantage to them. Slowly but surely there buildings and their materials will decrease because of it!!!

There is not much we can do about the majority of Methane producers. The only thing that I can suggest is to stop Biomass burning and decrease the amount of gas drilling, venting and transmission.

When they talk about Nitrogen Oxides in fertilizers for farmers and what it is doing to plants and the surface of the earth, why can't they raise the prices of fertilizers so that it makes it harder for farmers to buy it. The farmers that do buy it, some of their money can go towards extinction of other toxic chemicals.

There are a lot of companies who produce Chlorofluorocarbons these days. C.F.C's are extremely dangerous to the earth and the Ozone layer, but there are substitutes for C.F.C's. Even if they are more expensive to manufacture, they can stop the depletion of the Ozone. There should be no reason for not stopping the production of C.F.C's and start bring in the substitutes!!!

It seems that Alberta is using an extreme amount of energy. Isn't there some way we can reduce the amount of energy needed for our industries?

Transportation is the leading producer of Volatile Organic Compounds. You see so many cars burning fuel 24 hours a day with only one person per car! The Goverment should explain with commercials on T.V. and radio and bill boards that car pools are better for the environment and it will also save people money!!!

The only way to reduce Acid Deposition is to stop emissions of Sulpher and Nitrogen Oxides. The biggest producer of Nitrogen Oxides is automobile exhaust so people should start taking the bus, walk or organize car pools.

I cannot suggest much for saving the Stratospheric Ozone except, "BAN ALL C.F.C'S" but there are things we can do to prevent Ozone at Ground Level. Most producers of Ozone at Ground Level are Nitrogen Oxides and Volatile Organic Compounds and as I said earlier in my letter there are ways of producing these pollutants.

Although a small percent of Carbon Dioxide is man made, there still are ways to stop Carbon emissions. For one, we could stop burning substances that contain Carbon Dioxide. Instead of burning them, find a more enviormentally safe way of either using them of getting rid of them.

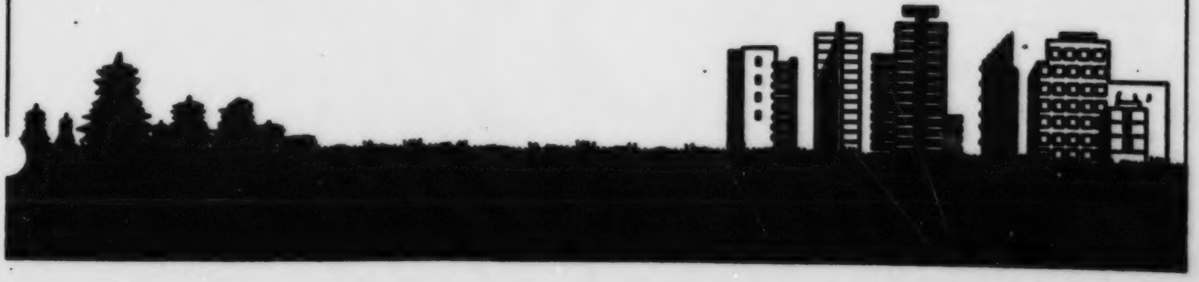
Well, these are my comments on the major pollutants of Alberta. I hope any one or all of them can be of use to you in saving our beutiful earth.

Sincerely,
Justin Crawford

Clean Air Strategy for Alberta

Response Form

ADAM.WADE.DOBRANSKI.
STUDENT'S NAME
DEWBERRY SCHOOL
SCHOOL
MR.HANNA
TEACHER
GRADE 9 JANUARY 14, 1991
GRADE **DATE**



To save the ozone layer people should replace aerosole cans with pump spray cans, also find less harmfull replacments for gas, oil propane, ect.

To keep sulfhur oxides out of the atmosphere, refinaries and factories should put pollution control systems on stacks to catch the more harmfull polutions.

To reduce nitrogen oxides people might start up car pools, such as going on a bus or goining up with other people.

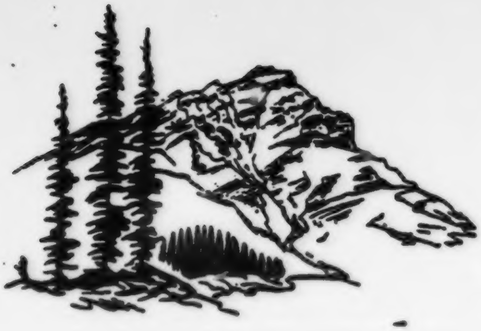
Something people could do about cfc's is replace aerosole cans with pump spray cans, replace airconditionners with fans.

For energy eficiency people could get air ventilators for their furnaces so it is not heating stale air.

To prevent voc's in the air we could put filters on vehicle exhaust systens to filter the voc's out.

To reduce acidic deposition, containers which once had any kind of acid in it, should be disposed of properly.

To reduce carbon dioxid(dry ice) pollution people should us ice instead to cool things. It would also take the place of airconditioners, freezers, ect.



Banff Elementary School

Banff School District No. 102

Telephone 403-762-4465
P.O. Box 748
Banff, Alberta
T0L 0C0

November 9, 1990

Hon. Rick Orman
Minister of Energy
714 Legislature Annex
Edmonton, AB
T5K 1E4

Dear Mr. Orman:

We have been studying Alberta's natural resources in Social Studies in Grade Four A. During our discussions, we became concerned about how we use our resources and how it affects the environment. These are some concerns and suggestions our class would like you to take action on:

1. Fossil fuels are non-renewable. Using them pollutes the environment.
2. We would like scientists to research for new sources of energy such as solar power, wind power, efficient burning of garbage for energy. Maybe they could be creative and think of ideas like riding bicycles to generate electricity.
3. We need fossil fuels for other things besides running factories. A time will come when there will be no fuel left, so let us change the factories so they will use some other form of energy. This will also pollute the environment less. We would like to use windmills and wind power instead of fossil fuel. Wind is renewable. It does not pollute the earth. We have a lot of wind in Alberta.
4. If factories and refineries ran on wind-power (electricity) we would not need to use river water to cool down the machines in factories, and which will then raise the temperatures of the river. This would help save the ecosystem.

5. Also, we have too many factories on one river. We would like to have a law that says if a factory is not run by wind it can not be located on a river. This would force factories to become more efficient with their sewage and protect our river.

6. Instead of dumping wastes into a river put it in storage until it can be taken to the Alberta Special Waste Management facility at Swan Hills.

7. We realize that it is expensive to destroy garbage this way. What we need is another plant to do it. If our factories were wind-operated, we might be able to recycle its generators and use them in a new incinerator plant, like the one at Swan Hills.

8. Our tax dollars could help pay for these ideas. We want you to use that money for research and development in the areas of wind-power, solar power and other sources of energy besides fossil fuels.

In our school, we care about the environment. We create less garbage, reuse paper, save energy (shut off lights in unused rooms), recycle paper, recycle cans. We have an environment club and have lots of enthusiasm, ideas and support. In our town we recycle bottles, paper and use recycled paper.

We want our government to listen to the concerns of the voters of the future.

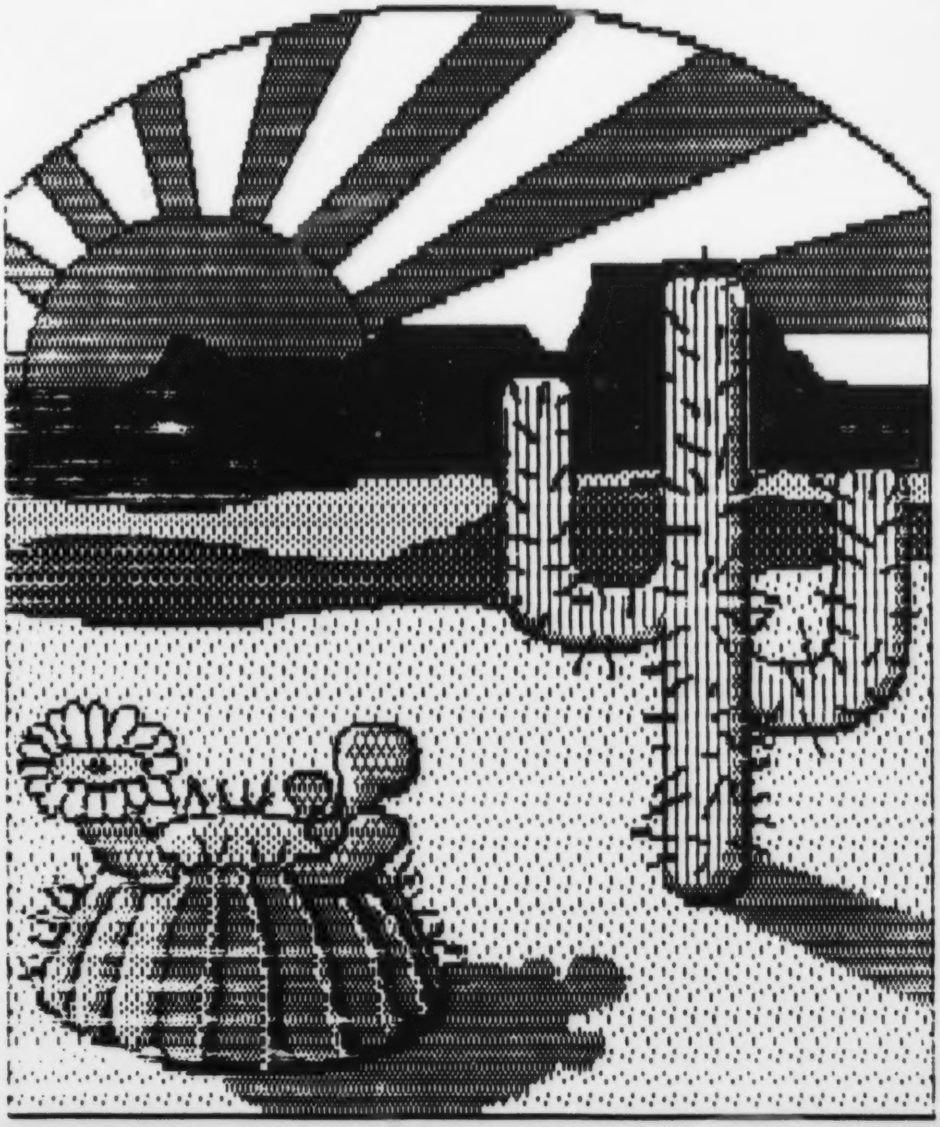
Thank you for your reply.

Sincerely

The Grade 4A Class
Banff Elementary School

c.c. Hon. Ralph Klein, Minister of the Environment
Hon. Brian Evans, MLA for Banff - Cochrane
Hon. LeRoy Fjordbotton, Minister of Forestry, Lands and Wildlife
Hon. Leslie Taylor, Mayor of Banff
Ms. Beth Woolley, Banff Recycling Society
Mr. Gerry Percy, Superintendent, Banff School District
Mr. Brian West, Principal, Banff Elementary School
Mr. Richard Blonski, Editor, Banff Crag & Canyon
Mr. Gary Frey, School Trustee, Banff School District
Mrs. Janis Tarchuk, School Trustee Chairman, Banff School District

Let's Clean Our Air



LET'S CLEAN OUR AIR

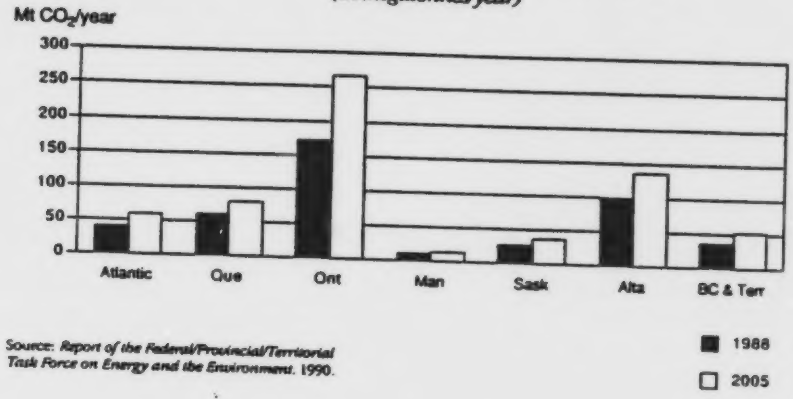
This is a famous quote that G. Lowes Dickinson wrote in 1898; it's nearly 100 years old and is still true to this day.

> Dissatisfaction with the world in which we live, and determination to realize one that shall be better, are the prevailing characteristics of the modern spirit.

There are a lot of things in the world that many people are dissatisfied with, but one that should be most prevalent is clean air.

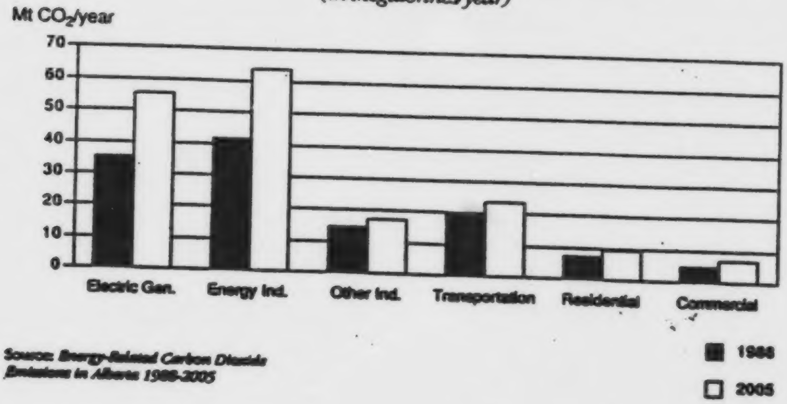
There are many different types of air pollution which we should be aware of. You may not be aware of this but CO_2 is a major cause of air pollution, it's produced when any substance containing carbon is burned: such as fossil fuels.

Carbon Dioxide (CO_2) Emissions by Province
(in Megatonnes/year)



Source: *Report of the Federal/Provincial/Territorial Task Force on Energy and the Environment.* 1990.

Alberta Carbon Dioxide (CO_2) Emissions
(in Megatonnes/year)



Source: *Energy-Related Carbon Dioxide Emissions in Alberta 1988-2005*

1. - elec. gen. responsible for 1/3 of CO_2 burn coal for electricity

- energy ind. responsible for 1/3 - sugar beet factory major industry in Taber - use major amounts of fossil fuels - natural gas used in order to dry sugar crystals

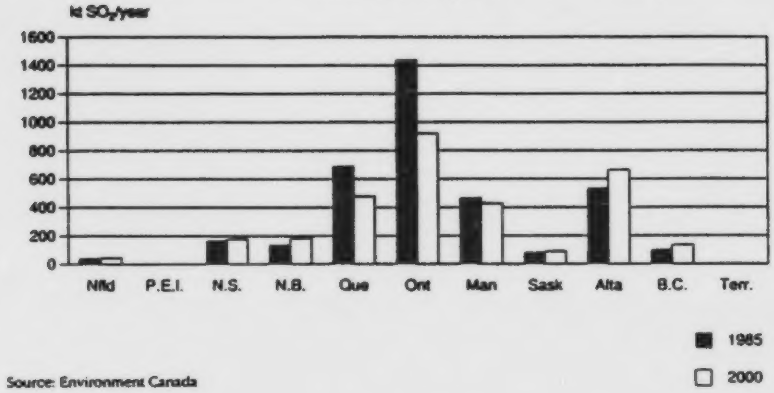
- everything else other 1/3 - though cars emit CO_2 not nearly as bad as industry

2. - Ont. leading producer of CO_2 emissions
   - AB. second - Ab. leading per capita
   - 2005 still increasing

CO_2 is most common of the man-made green house gases and is believed to be a significant contributor to global warming.

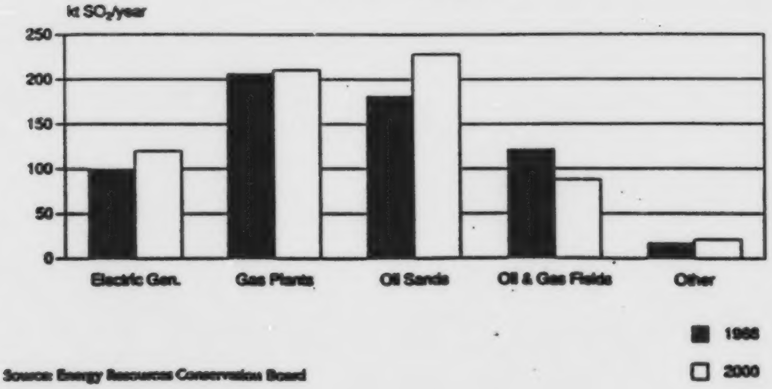
Though Ab doesn't have to worry very much about acid rain right now because of the alkaline dust if we continue to burn fossil fuels and emitting sulphur oxides and nitrogen oxides our situation will become increasingly worse.

Sulphur Dioxide (SO_2) Emissions by Province
(In Kilotonnes/year)



Source: Environment Canada

Alberta Sulphur Dioxide (SO_2) Emissions
(In Kilotonnes/year)



Source: Energy Resources Conservation Board

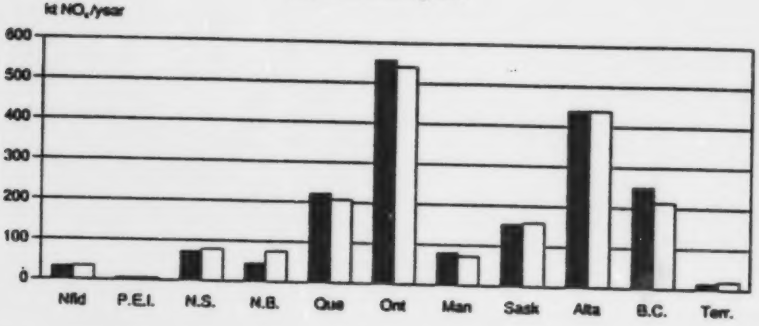
SO_2

1. Ont. and Que. are the two leading producers of SO_2 both have inacted legislation to decrease by 2000

- Ab still is highest per capita - amount will increase because of lack of legislation

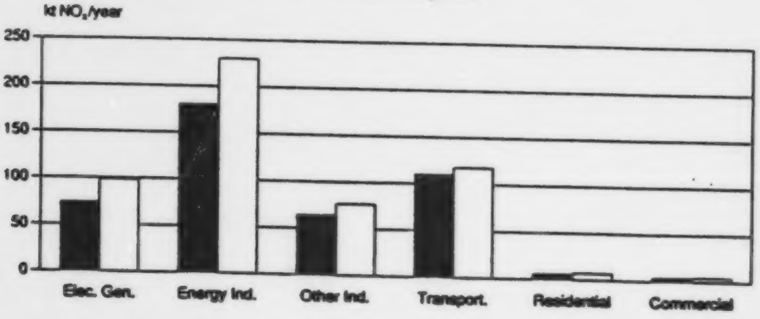
2. Reason why rate so high because of our involvements in these industries(point them out)

Nitrogen Oxides (NO_x) Emissions by Province
(In Kilotonnes/year)



Source: *Canadian Council of Ministers of Energy*
Report on the Status of National Inventory of NO_x/VOCs

Alberta Nitrogen Oxides (NO_x) Emissions
(In Kilotonnes/year)



Source: *Energy-Related Nitrogen Oxide Emissions in Alberta 1988-2005*

NO_x

1. In NO_x Ab. is leading per capita **still**
- Que. and Ont. by 2000 decrease in amount while Ab remains same.

2. Emissions due largely to our involvement in industries which are on the graph

Methane is a green house gas that occurs naturally. Natural processes contribute about 1/2 of the methane in the atmosphere; the rest comes from agriculture and the production of fossil fuels.

Burning of fossil fuels is a major man made cause of nitrogen oxides, while use of volatile organic compounds or VOC's. At ground level ozone is formed when nitrogen oxides and VOC's react in the presence of sun light.

CFC's are man-made chemicals that exist as lizuids or gases. They do not occur naturally, they are always manufactured. CFC's contribute to the greenhouse effect and also to the thinning of the ozone layer.

Not all of these gases make an equal contribution to the greenhouse effect. Compared to a CO_2 molecule, methane has 20 times the impact, nitrous oxides 200 times, ground level ozone 2000 times, CFC's 13000 - 20000 times.

As we were putting together this presentation we noticed that since we had so many different opinions it was hard to decide on what to do. So a couple of students got together, separate from the group and decided on what was to be done. We can relate our project to the environment and what needs to be done. We need a leader to decide on what to do, though still taking into consideration other peoples points of view. For if no one take charge, nothing will ever get accomplished.

The first thing we should focus on is what we can do right now. Start with short term goals with long term goals in mind.Each person must do their part to help the environment. We can start with recycling. This may not seem conected with clean air, but it is. If we don't recycle the garbage that we produce will eventually end up in landfills, wich emit harmfull gases into the biosphere. We can separate our garbage into organic and inorganic piles. Right now in Ab. all we are able ot reccle are bottles aluminum cans and paint cans. This is not nearly enough. Another thing that we can do is limit our driving time. People don't need to drive around as much, cruising is unnecessary. All of us should learn to car pool as much as possible.

The government should do it's part too. It is our opinion that the gob't should subsidize more money on environmental problems, than on other unnecessary progects. They should five money to businesses who are willing to change their business or start up new ones to better the environment. The most important thing that they can do is make laws to help clean the air

The gov't should set a time line for when the law is officially to start. For example, when we change came about gradually. The gob't decided that by this year all gas was to be unleaded. And we met that deadline, by reducing the amount of leaded gas sold.

Using the afore said method, we can change into a new environmentally safe fuel. Most people don't concider hydrogen is a possible fuel source, or they think that it's not a realistic substiture for fossil fuels. But research shows that hydrogen could be a possible alternative fuel in the future.

David Scott, a leading hydrogen proponent at the U of Vic in BC says that "there is zero uncertainty that a hydrogen economy will evolve over the next several decades"

Two main reasons why hydrogen would be an ideal fuel are: 1. supplies of it are virtually endless

2. Burning hydrogen does no harm to the environment for it simply returns the gas to the form of water

Another reason why hydrogen would be an ideal fuel is because hydrogen is a uniquely flexible medium for the storage and distribution of energy. It is easily converted into electricity through the use of a fuel cell, and electricity can be turned back into hydrogen by electrolyzing water. Transmitted through pipelines similar to those used for natural gas, it can carry energy from large, remote powerplants to individual homes and factories as electricity does now - but with far greater efficiency. And unlike electricity, hydrogen can be kept in tanks to fuel vehicles, or to store power for periods of peak demand.

The way hydrogen is produced is not too complicated. Large array's of photovolactaic cells similar to those that now power pocket calculators would make electricity from the suns rays. The electric current would them be used to break down water molecules into thir constituent elements of two hydrogen molecules and a water molecule. Then the hydrogen would be placed in storage ready for use. When needed it would travel through pipelines to buildings for electricity and heat. The stored hydrogen could also be used as gasoline in cars.

How does stored hydrogen provide electricity? Fuel cells convert hydrogne and oxygen into electricity and water, essentially reversing the electrolysis process that turns water into hydrogen. Like a storage battery, they consist of stacks of electrodes interleaved with layers of electrolyte. Hydrogen and oxygen are supplied through pores or capillaries in alternate electrodes. Hydrogen ions produced by reactions on one electrode pass through the electrolyte and react with oxygen atoms on the other. The result is an electric current through wahtever is hooked up to the electrodes.

Once hydrogen becomes available at a reasonable cost, one of the first large markets for it is likely to be transportation. Converting even a small portion of the cars in polluted areas to hydrogen could cut smog substantially, and at less cost than new mass-transit systems.

As some of you might already know; there have been several experimental vehicles produced in Germany, using a variety of approaches to hydrogen's engineering challenges.

The BMW has focused on using liquid hydrogen stored in vacuum superinsulated tanks. While the Mercedes has used metallic hydride storage media, which are completely safe, but need to be very heavy to store large amounts of fuel.

In the BMW there are two fuel tanks. One for hydrogen and the other for gasoline. So the car can use hydrogen but revert back to gas when necessary.

So after all research is completed and a way is found to use hydrogen as a fuel effectively we could follow the model of the BMW. Build cars with both hydrogen and gasoline tanks, and in gas stations sell gas but also have a few hydrogen pumps. Then have the gov't set up a time line. Saying that by such in such a date all car fuel is to be hydrogen. Then gradually we'll get more and more hydrogen pumps and less and less gas pumps so by the designated date all gas will be gone.

Well gas won't be gone literally, and neither will fossil fuels, but instead of burning them we can use them for other useful things which don't have as harmful of an effect on the environment. Things like paints, make-up, plastics etc. are all made from fossil fuels. So even though we'll still be using our fossil fuels we won't be killing our world while doing it.

We, as students, now realize how important clean air should be to us. We have researched this topic thoroughly and have convinced ourselves as to how harmful the emissions we put into the air really are.

Since statistics show that Alberta is the leading producer of harmful gases per capita, we as individuals and also as a province must work on reducing our pollution of the atmosphere.

As we have shown you, we can start the reduction of the pollutants as individuals. Even though as individuals, what we can do is of small significance as to what we can do as a province, we cannot rely on others to do it. The place to start is with ourselves.

By:

[illegible] Murphy

W.R. MEYER H.S.
TABER, ALTA
T0K 2G0

A BRIEF TO A CLEAN AIR STRATEGY FOR ALBERTA

DECEMBER 5, 1990 - CALGARY, ALBERTA

FROM: THE ALBERTA FISH AND GAME ASSOCIATION
6924 - 104 Street
Edmonton, Alberta
T6H 2L7

PREPARED BY: Dr. Niels Damgaard, President
Dr. Martha Kostuch, Vice President

alberta
fish & game
association

DRAFT

CONTACT PERSON

Dr. Niels Damgaard
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The Alberta Fish and Game Association
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Calgary, Alberta
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BACKGROUND

Established in 1909, the Alberta Fish and Game Association today has over 15,000 members representing 11,000 households from over 120 affiliated clubs. This clubs represent over 100 communities throughout Alberta, to provide a strong voice to government and others on behalf of our natural resources.

The association strives to promote through education, lobbying and programs, the conservation and utilization of fish and wildlife and to protect and enhance the habitat they depend upon.

The objectives of the association are:

1. To promote conservation of our natural resources.
2. To foster and promote the non commercial harvest of fish and game as a legitimate part of an overall wildlife management program.
3. To develop and promote educational and recreational programs and activities.
4. To promote and assist in the sound long term management of Alberta's fish and wildlife in the best interests of all Albertan's including future generations.
5. To insist on continued public ownership of all public lands and wildlife.
6. To obtain and maintain access to public lands.
7. To publicize the importance of fish and wildlife and proper resource management.

8. To work with government, industry and other organizations in local programs, supporting the enhancement, development and maintenance of habitat for all species of fish and wildlife in Alberta.

9. To lobby government and private agencies as necessary to safeguard the interests of fish, wildlife and other natural resources.

10. To promote outdoor ethics and safety.

11. To make Albertans aware of the dangers of all forms of pollution, to prevent pollution and to co-operate with all groups with similar objectives.

The association adheres to the three international principles of resource conservation, developed by the World Conservation Strategy and these are:

1. To maintain essential ecological processes and life support systems.
2. To preserve genetic diversity.
3. To ensure the sustainable utilization of species and ecosystems.

Because clean air and water, with a relative lack of pollutants, is so vital to natural ecosystems, the association has prepared this brief. It is hoped that there will be a political will to follow through with proper recommendations, developed by this public process, through a "Clean Air Strategy" for Alberta.

The association is grateful for this opportunity to air our concerns and looks forward to a co-operative dialogue with all concerned.

CARBON DIOXIDE EMISSIONS AND THE GREENHOUSE EFFECT[1]

The "Greenhouse Effect" is largely caused by the increases in concentrations of greenhouse gases, including carbon dioxide (CO^2), chloroflurocarbons, tropospheric ozone, nitrous oxide and methane. Other contributions to the "Greenhouse Effect" come from forest clearing and destruction of ocean phytoplankton, but these are other stories.

Continuing alteration of the global atmosphere threatens global security, the world economy, and the natural environment through climate

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[1] This section is a condensation of three articles written by Dr. Martha Kostuch, the association's Vice President, entitled *THE HEAT TRAP*, *CHANGING ATMOSPHERE*, and *THE GREENHOUSE EFFECT*. Some additions have been made for relevance.

warming, rising sea levels and altered precipitation patterns. These changes will imperil human health and welfare, diminish global food security, increase political instability and the potential for conflict, jeopardize prospects for sustainable development and accelerate extinction of animal and plant species.

In Alberta, the major impacts will likely be to agriculture, forestry and wildlife. More droughts will result in reduced yields, an increase in crop diseases and pests and more wind erosion. There will be less water available for irrigation and the rate of evaporation will increase. It is predicted that there will be an increase in the frequency and size of forest fires and epidemics of insects and diseases. Wildlife will be affected by both the loss of wetlands and the impact on forests.

Unless action is taken now to reduce build up of green house gases, we are wasting money and a lot of time and effort trying to protect and develop wetlands and many other habitat related projects. If the earth's temperature continues to rise as predicted there won't be any wetlands or some other habitat types in the prairie provinces.

It is so readily apparent that wildlife will suffer if the rate of warming is not reduced. It is predicted that 50% of the species found on earth will become extinct because of this "Greenhouse Effect".

The one source of greenhouse gases that stands out above all others is the burning of fossil fuels. Fossil fuel contribution is responsible for 50% of the warming trend from the "Greenhouse Effect". Since CO^2 is the major product of fossil fuel burning, reducing CO^2 emissions is the single most important measure to reduce climatic change.

Early in 1989, the association easily endorsed the following resolution:

Be it resolved that the Government of Alberta establish a goal to reduce CO^2 emissions by at least 20 percent of 1988 levels by the year 2005.

We believe that is a realistic goal and encourage policies to achieve that goal in a timely fashion.

Policy options to achieve the 20% reduction of CO^2 emissions include:

1. **Energy Conservation and Improved Efficiency of Energy Utilization**

Increasing the prices of non-renewable energy is the most efficient

method of stimulating energy conservation and improved efficiency. This could be done in Canada by establishing floor prices for Canadian oil, putting tariffs on imported oil to raise it to the floor price, and charging higher royalties for non-renewable energy sources. The free trade agreement may prove a constraint on such a policy.

A "carbon tax" has often been suggested thus giving governments a funding source to encourage a switch to more renewable energy sources. The "carbon tax" would also raise the price of non-renewable energy sources thus encouraging efficiency and conservation.

Steps would need to be taken to assist the poor who would be hurt by higher energy prices. Internationally, agreements to reduce non-renewable energy production would raise the world price for those resources.

Higher prices should be charged for greater volumes of non-renewable energy rather than lower prices as is currently the practice.

If necessary, changes should be made to the taxation system which will encourage energy efficiency. Extra costs associated with retrofitting or building for energy conservation or efficiency should be able to be written off at a faster rate. Higher property taxes should not be charged for structures added to improve energy conservation or efficiency.

Other ways of reducing energy consumption include better planning, lowering of speed limits, and co-generation. Better planning includes planning cities, industries and homes to be more energy efficient. More and cheaper public transportation systems are required.

2. Renewable Energy

Just as economic disincentives are the most efficient method of discouraging non-renewable energy consumption, economic incentives could be used to encourage use of renewable energy.

Incentive pricing should be used for renewable energy. Provision should be made to allow the sale of excess renewable energy into the electric grid at a price that will encourage renewable energy production.

Government and industries should be encouraged to provide funding for research and development of renewable energy (a carbon tax could be such a source of funding).

Canada and Alberta in particular, should become a world leader in renewable energy technology. Not only would this reduce our own consumption of non-renewable energy (one of the highest per capita in the world today), but it would also help our economy because we could export the technology and expertise to other countries.

3. Reduction of Emissions

Efforts should be made by industry to reduce emissions at the source. This could be done by the addition of pollution control technology and by finding beneficial uses for the emissions, i.e. use of compressed CO^2 to pressurize oil wells.

Several methods could be used to require or encourage industry to reduce emissions. Legislation and regulations could be used to establish maximum emission limits and require licensing of each source. Emissions ceilings could be established for each area or region. Industries could be charged for their emissions at so much per tonne. Tax credits could be traded for emissions. Tradable emission permits could be used as an incentive.

Vehicle CO^2 emissions can be reduced also by increasing efficiency of engines and by use of fuels that are more efficient, such as natural gas and propane.

4. International

Steps must be taken to reduce the emission of carbon dioxide on a global basis.

Reduction targets should be established through international negotiation and treaties. The targets should be based on levels that are necessary to prevent atmospheric change.

International laws should be used when appropriate.

Technology and products which are banned in the originating country should be prohibited from export.

The World Bank should only fund projects which do not contribute to changing the atmosphere. Mechanisms must be established to reduce third world debt.

All countries should develop conservation strategies.

Governments, particularly the Alberta Government, simply cannot sit and debate the need for an overall CO^2 reduction for the preponderance of scientific thinking is overwhelmingly clear, CO^2 emissions must be reduced. That would require some fundamental changes in political thought and processes in this Province. Our association would certainly be prepared to support a government with the conviction and courage to institute these needed changes.

NITROGEN OXIDES AND VOLATILE ORGANIC COMPOUNDS[2]

Nitrogen Oxides (NOx) and Volatile Organic Compounds (VOCs) are both major pollutants in their own right as well as precursors to ground level ozone. Alberta's share of Canada's emissions of both NOx and VOCs is high and is predicted to increase significantly.

During the summer months, about half of the Canadian population is exposed to ozone levels which are known to have health effects. Ozone produces eye, nose and throat irritation. High ozone concentrations can cause immediate short term changes in lung function and respiratory symptoms. Chronic exposure to ozone is known to damage the tissues lining the airways of the lung and is suspected of playing a role in the development of chronic lung disease.

Maximum growing season ozone levels are routinely being exceeded across most of the country. The effects of ozone on agricultural crops has been well documented. Ozone is also known to cause foliar injury and reduced growth rates in sensitive tree species. Exposure to ozone can also increase susceptibility to secondary stresses such as insects and disease.

We feel more emphasis should be put on integrated solutions to air pollution problems including NOx, VOCs, CO^2, sulphur dioxides, etc. Non-technical solutions such as energy conservation, lifestyle changes, mass

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[2] **This section was condensed from an article by Dr. Martha Kostuch, the association's Vice President, entitled *NITROGEN OXIDES AND VOLATILE ORGANIC COMPOUNDS*. Some changes have been made to add relevance.**

transit, etc. should also receive more consideration.

The management plan which has been developed to reduce NOx and VOCs emissions, should be implemented.

In a technical briefing in August, the Federal Government indicated they are taking a market driven approach to energy efficiency and diversification. Upon questioning, they indicated they will not be taking a market based approach to fossil fuel development because of the need for regional development and jobs. In other words, the Federal Government is prepared to subsidize the destruction of the environment but not the protection of the environment (similar comments can be made about the Alberta Government).

SOUR GAS EMISSIONS[3]

When most people think of acid rain in North America they automatically think of Eastern Canada and Northeastern United States. But concern about acid rain or, more properly, acid deposition extends to Western Canada as well.

Alberta accounts for 68% of the sulphur dioxide emissions in the three western provinces and 50% of the nitrogen oxide emissions.

Approximately 50% of the sulphur dioxide emissions in Alberta are from sour gas plants. There are over 100 sour gas plants in Alberta, most of them located along the foothills of the Rocky Mountains. Existing plants that process under 10 tonne a day of sulphur are not required to recover sulphur emissions. Plants that recover sulphur emissions average over 97.5% recovery with some plants recovering over 99%. However, the amount of sulphur emissions from these plants is still considerable because of the number of plants and the large volume of sour gas they process. New plants or plants making large expansions will be required to recover more sulphur emissions, but still best available technology will not be used for the majority of them.

Recently, companies have been looking for gas that is more sour

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[3] Adapted from an article by the same title written by Dr. Martha Kostuch, the association's Vice President. Some additions and relevant changes have been made.

(contains more hydrogen sulphide (H^2S)). Because of the high price they are receiving for sulphur, many companies are now making as much or more money from the sale of sulphur as they are from the sale of gas. The first pilot sulphur plant (where gas will be a by-product) has now opened. The gas being processed there contains over 90% H^2S.

The total average sulphate deposition (wet plus dry) in Alberta is now 26.4 kg/ha/year. The target level established to protect moderately sensitive areas in Eastern Canada is 30 kg/ha/year. The target level that has been recommended by the Federal/Provincial Committee on Long Range Transport of Atmospheric Pollutants to protect highly sensitive areas is 12 kg/ha/year.

As you can see, the average sulphate deposition in Alberta is nearing target levels established to protect moderately sensitive areas and is over double the level recommended to protect highly sensitive areas.

In Alberta, dry deposition accounts for over 50% of the acid deposition. Dry deposition becomes more important closer to the source.

Most of the concern about acid deposition in Alberta is close to the sources of emissions. In the foothills, the irregular terrain seems to play an important role in determining the distribution of the plume and thus where the effects occur.

Between 5% and 10% of the lakes in Alberta are highly sensitive to acid deposition. Most of the sensitive lakes are in Northeastern Alberta (where the oil sands plants are located) and in alpine areas.

Fortunately, much of Alberta has well buffered soils and therefore somewhat resistant to acid deposition. However, about 22% of the soils in Alberta are highly sensitive and over 30% are moderately sensitive.

Agricultural crops, especially legumes like alfalfa and clover, and forests can also be affected by acid deposition. Some of the effects are caused by direct absorption of sulphur dioxide through the leaves. Some crops grow more poorly in acidic soils.

Sulphur dioxide can also reduce the viability of microorganisms. Some microorganisms are important for their ability to convert nitrogen to a form usable by plants.

Other concerns include rusting of metals, such as barbed wire and machinery, and animal and human health effects.

Animal health complaints include respiratory diseases, increases in deficiencies of certain trace minerals (i.e. selenium, copper, and zinc), white muscle, reduced fertility, increased susceptibility to disease, and reduced rate of gain.

People in Alberta who live near sour gas plants feel that their health is being adversely effected by sour gas emissions, especially when there is an inversion, an upset at the plant, or when a well is flared. And it is not only people who live near Pincher Creek who are affected. People living near Grand Prairie, Sundre, Lacombe, Mayerthorpe, Rimbey, St. Albert and many other areas of the province are concerned about the effects of sour gas on their health.

The Southwestern Alberta Diagnostic Review done by the Spitzer group (1986)[4] did in fact identify certain medical problems in the study groups even though the study was not designed to look at the long term effects of sulphur deposition on human health. From the Spitzer study we can identify four specific areas of medical concern when it comes to sulphur deposition:

1. chronic bronchitis,
2. dermatitis,
3. neurological problems including bilateral deafness and back problems with neurological signs, and,
4. hypertension.

In fact, Spitzer himself pointed out the hypertension problems should be further looked at.

Fish and wildlife are affected by sour gas emissions in several ways. Fish are affected when surface water is acidified even for short periods of times as happens with acid shock that can occur during spring run off. Wildlife health may be affected directly as is the health of domestic animals or indirectly, as a result of trace mineral deficiencies or loss of food or habitat which occurs when forests and other vegetation is damaged or lower animals on the food chain are decimated.

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[4] *THE SOUTHWESTERN ALBERTA MEDICAL DIAGNOSTIC REVIEW: SUMMARY, METHODS AND RESULTS.* McGill Inter-University Research Group, Walter O. Spitzer, Chairman. Alberta Government/Industry Acid Deposition Research Program. 104 pp.

The solutions are obvious, and that is we must have a reduction in sulphur emissions. Surely, best available technology must be used on all sulphur emissions, even small producers. Provisions must be put in place to allow companies to retrofit plants to meet new and tougher emissions standards. There has been some movement by governments to address the problem. Health effects and other effects are just too important not to move on this matter.

The three Western Provinces should sign an agreement with the Federal Government to control the level of acid forming emissions.

Any financial aid that the Federal and Provincial Governments supplies to the heavy oil industry should be contingent upon a reduction in emissions from the existing plants. Similar aid to other companies that have sulphur emissions, should also be subject to the same contingency.

HEAVY METAL EMISSIONS[5]

Suncor and syncrude are the largest point sources of sulphur dioxide in the province. The tar sands plants also emit many heavy metals including vanadium, nickel, lead, titanium, chromium and cadmium. For example, 2.4 kg/day of vanadium is emitted from Syncrude's Mildred Lake Plant.

In 1976, the concentration of metals (i.e. Al, As, Fe, Mg, Ni, Ti, V, etc.) increased in lichen and moss tissues as the oil sand plants were approached. Analysis of lichen samples collected in 1983 shows that the concentration of these metals had continued to increase since 1976.

The titanium content of lichens near the Syncrude plant reached 500 ppm. The vanadium content reached 160 ppm. There is no question that there is bioaccumulation of these heavy metals near Syncrude's plant. The vanadium extraction plant recently announced should help reduce the emission of at least one heavy metal. More needs to done to reduce the emissions of heavy metals from the tar sands plants.

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[5] Adapted from an article of the same name written by Dr. Martha Kostuch, the association's Vice President. References can be supplied on request.

INDOOR AIR QUALITY

Many Albertans are exposed to air that is simply unfit for human health. The source of this may surprise some, but this bad quality air comes from indoors. Scientists and the medical establishment are now starting to recognize the situation. New names are cropping up to describe a host of indoor air related disease.

To the surprise of many there are virtually no regulations for indoor air quality. A clean air strategy for Alberta must address the importance of indoor air.

A person's home may be the biggest source of airborne pollutants one faces in Alberta. We are nearly powerless to do anything about it. However, if more testing of homes for some of the more toxic pollutants were carried out at little or not cost to the home owner, then the public might take their own home and it's air more seriously. Radon gas is but one substance that needs testing.

The office is often a bad place to be, because of the build up of gases that have a negative effect on individuals. The "sick office syndrome" is a real entity, and it must be dealt with. Modern building design may be airtight and energy efficient, but if that design results in the build up of unhealthy gases and particulates, we are no further ahead.

However, without regulation and enforcement of clean air for the indoors, little may happen until the health effects become more readily apparent.

There is no question that worker productivity and general health is enhanced when they are treated to good quality, clean and fresh air. That is the positive result of a good clean air strategy for the indoors as well.

The workplace often has unknown air problems. Recently a patient of mine was finally diagnosed of having chronic carbon monoxide poisoning, even though he did not work near a source of this gas. However, the buildings ventilation and drafting system forced all the building's gases into his specific work area, which was a good distance from the source. The only way to deal with the problem was to have Occupational Health and Safety take a look and do some testing, something that would not have occurred had I not been able to define the patient's condition with appropriate laboratory evidence.

A system to deal with worker's complaints about indoor air quality should be in place. Surely we should not have to put up hard medical evidence before a complaint is dealt with.

HUMAN HEALTH DIMENSIONS

To no one's surprise good, clean and fresh air is good for our health. It would logically follow that polluted, unclean and stale air is unhealthy. But what are the effects of such "bad" air on human health?

We in the medical profession are the ones who see the results of poor air on human health. Certainly we can do little to help a smoker if he decides to continue to smoke in spite of our protestations and multiple regulations. But that would be a self induced injury, but what of the person who passively must take in "bad" air?

At present more Canadians than ever are dying of something called reactive airways disease. It was thought that this entity was really only another entity called asthma. But typical asthma is caused by a true allergic reaction to an allergen. Allergens are proteins usually, and not typical air pollutants. However, more people are now dying from exposure to non-allergen types of air pollutants.

The seriousness of these deaths has prompted an unprecedented study launched by the medical examiners office in Alberta. As a family physician, I personally was aware of the increasing number of people having this reactive airways disease, that does not readily respond to conventional asthma therapy. At one point, there was rationing of treatment drugs in Canada to deal with this disease entity.

Modern medical evidence seems to suggest that airborne pollutants are a major cause or contributing factor of reactive airways disease.

Reactive airways disease is serious and it's prevalence is rapidly increasing, especially in larger cities. That is not surprising considering the pollutant loads urban dwellers must face outdoors and indoors.

The health effects of acute sour gas exposure are well known but the long term effects of low levels of exposure are largely unknown to the public. The Spitzer study, alluded to earlier in the brief, and a recent study in Nova Scotia related to low level sulphur emissions from a pulp mill, indicate even low levels of sulphur emissions can have detrimental human health effects.

Chronic carbon monoxide poisoning is common among workers dealing with automobiles that have the engine running. Often symptoms are only occasional mild headaches.

Radon gas exposure from one's own home distinctly increase one's risk for a host of cancers. The effects of other rare gases are largely unknown.

Compromising of human health is surely an indicator we have problems with the air we breathe. After all these ill people are not conspiring against polluters, they are merely passively reacting to them.

The time is long overdue for a clean air strategy that takes into account human health effects.

ACKNOWLEDGEMENT

I would like to thank Dr. Martha Kostuch for her contribution to this brief and excellent background articles she kindly supplied to me.

I appreciate the opportunity to allow our association input to this very important process. We look forward to the results and a continuing dialogue on the Clean Air Strategy For Alberta.

Thank you,

Dr. Niels Damgaard
President.

January 15, 1991.

Allergy Information
Association,
Edmonton, Alberta.

Clean Air Strategy
2nd Floor
10010 - 106 Street
Edmonton
T5J3L8.

Dear Panel:

Alberta is rapidly becoming known as the CO_2 capital of Canada and the Asthma capital of Canada. This is particularly upsetting to those of us with children of allergies and respiratory chronic conditions. We are not optimistic for the future health of these children or for the health of normal children. Doctors and allergists tell us that in Edmonton children are being diagnosed with asthma and other chronic lung disorders earlier and earlier in life, for example, a decade ago, children showed signs of asthma at age 4 or 5 years of age on the average whereas today, children are diagnosed frequently at age six months. Also, the frequency of asthma and bronchitis in Alberta is on the rise, and Alberta has more asthma deaths than any other part of Canada. I am pleading on behalf of all the children of Alberta, that Minister Klein do something significant to reduce the CO_2 emissions in Alberta. Epidemiological studies done by Dr. Bates have shown a dramatic rise of asthma on the prairie provinces coinciding with the increase of sulphur dioxide emissions, this inuludes asthma hospital admissions on the rise also.

Recently, Mr. Orman, our energy minister announced that Alberta cannot reduce its CO_2 emissions to match the goal announced by Mr. De Cotret last October in Switzerland. The world is looking to Canada to set an example for emissions in air and water. I and most Albertans would like to see Mr. Klein and Mr. Orman and the forestry minister to encourage smaller more conservative projects for a province such as ours, such as non mega pulp mills which do not emit cancer-causing dioxins, and steer away from anymore mega oil projects. Surely a province of such potential such as Alberta can promote more than gas and pulp. Many of us cannot afford to drive much anymore in Alberta, an energy rich province with high prices and we seek alternative cheap transportation safe for the use of women and children. We know if we only use the tremendous capacity of the citizens of Alberta, we can solve our CO_2 emission dilemma.

Being close to the largest pulp mill in the world at Athabasca, worries Edmontonians, and we would like Minister Klein to let our association know what air emission standards, Alpac will be asked to comply with, especially for SO_2 emissions and the burning of wood chips which emit dioxins. The burning of chips must be discouraged as this has a dramatic effect on lungs, especially children's lungs, and Canadian children are showing a dramatic reduction in lung capacity when tested in hospitals.

Because most Albertans live in Calgary and Edmonton, we expect real leadership from Minister Klein, especially in stopping the burning of use oil at the Calgary International Airport along with the other airports in large populated Alberta centres, and expect stringent air emission standards for any new industry and a plan to upgrade old existing industries.
Our government must lead in the protection of our air and our right to clean air and healthy lungs. People with lung disease pay a heavier price then most by living in an area that is refinery-bent, such as Calgary and Edmonton, but we all pay the price for high SO_2 emissions. Since lung disorders are on the rise, we must reverse this trend to encourage more and more industry with the need to emit large quantities of effluents into our air and water.

Also, what is our government doing to protect we refinery city inhabitants from terrorist explosions due to terrorist activities?

Please write us as soon as possible as Edmonton is hosting the top speakers this May at the Allergy Conference for Canada. Thank you for your kind attention to our top concerns.

Sincerely,

L. Rubizna
Allergy Info Assoc. Edmonton.
c/o Box 4384
Edmonton, T6E 4T5

copy for Minister Klein

ATHABASCA TRIBAL CORPORATION

POSITION PAPER ON CLEAN AIR STRATEGIES FOR ALBERTA: A PERSPECTIVE OF NORTHEASTERN ALBERTA REGION

DRAFT

presented to

CLEAN AIR STRATEGY FOR ALBERTA

December 1990

INTRODUCTION

The Athabasca Tribal Corporation represents Indian Bands located within the Athabasca drainage within northeastern Alberta made up of the Indian Bands at Janvier, Fort McMurray, Fort McKay and Fort Chipewyan. Air quality issues have been subject to continuing debate in the northeastern sector of the Province of Alberta, since Suncor, Inc. began oil sands mining operations at Tar Island, north of Fort McMurray in the late-1960s. Since that time, major developments, such as Syncrude Canada Ltd. and recent proposals for Canstar Oil Sands Ltd., Alsands Ltd., AOSTRA, and the OSLO Project, have focused attention of our Native peoples, and the community of Fort McMurray, on the issue of air quality management in the region.

In the past five years, significant progress has been made in dealing with air quality problems in this region through the formation of the Fort McKay Interface Committee and the Regional Air Quality Co-ordinating Committee (RAQCC). These committees have allowed us to address air quality through the development of an Air Quality Protocol, reassessment of regional air quality monitoring systems, and the re-evaluation of sources of noxious emissions from the existing mining and upgrading facilities. We believe that these initiatives represent a major breakthrough in approaches to licensing, approving, monitoring and conducting research on air emissions.

Several principles which we believe are essential to the improvement and maintenance of good air quality in our region are described below. Many of these principles have been developed through discussions of the committees noted above and through mediations sponsored by the Energy Resources Conservation Board with Suncor, Syncrude and OSLO.

PRINCIPLES FOR AIR QUALITY MANAGEMENT IN NORTHEASTERN ALBERTA

1. EXISTING LEVELS OF EMISSIONS

The Alberta Air Emissions Inventory completed under the direction of the Acid Deposition Research Program (ADRP) in 1987 (Picard, Colley, and Boyd, 1987) indicated that the SO_x and NO_x emission sources for the Fort McMurray (northeastern Alberta) region were, by far, the highest combined point-sources in Alberta. These levels of emissions indicate that this region of Alberta is subject to significant depositional loadings from air pollutants and, should future developments occur, will probably continue to be subjected to at least these existing levels for the medium to long-term. Little research of quality used in the Acid Deposition Research Program (ADRP), is available to us to predict long-term effects from these loadings. It is also noted that oil sands developments are very long-term sources of emissions. As noted in Picard et al. (1987):

> "A ranked listing of the ten highest SO_2 sources in Alberta by emission region and ecoregion is presented in Table 8. Two oil plants dominate the list, accounting for 355.8 t/d of SO_2 emission, or approximately 28.1% of the total provincial SO_2 inventory (1267.0 t/d)....Total SO_2 emissions in Alberta are therefore dominated by a few large sources rather than by many smaller sources".

Given this background, the Athabasca Tribal Corporation considers that our region of the province should be recognized by the Government of Alberta as unique in its long-term exposure to atmosphere pollutants. The magnitude and number of major point-sources of SO_x, and associated emissions dictate that enhanced monitoring of, and attention to, atmospheric pollutant loadings be recognized on a continuing basis.

2. MAXIMUM POLLUTANT LOADINGS

The Athabasca Tribal Corporation (ATC) considers that the regional pollutant loadings of northeastern Alberta are presently at a maximum value, and total loadings should not be allowed to increase. We do not accept that pollutant loadings based on an arbitrary value for deposition in terms of kg/ha are a satisfactory long-term management strategy for the region. Instead, depositional loadings must reflect the total amounts of pollutants which are being emitted to the air. We also note that significant long-term research is required in order to verify the acceptability of existing pollutant loadings in the region. These depositional standards must be subject to public input.

It should be clearly recognized that the ATC considers that, from this date forward, the total emissions in this region should decline, irrespective of future developments or projects in the oil sands mining arena. This means that existing facilities will have to reduce their emissions, and future plants will have to substantially limit their total emissions.

3. AIR EMISSIONS ON PER UNIT PRODUCTION BASES

The ATC considers that emission limits should be tied to units of production at oil sands mining facilities. This implies that air emission limits should be tied to ongoing technological improvements. It also indicates that standards should not be set for the facility but rather for the technology for oil sands mining plants.

We note that Suncor, Inc. presently emits a much higher level of SO_2 on a per unit production basis (24.2 t $SO_2/10^3m^3$SCO) than Syncrude (8.1t/10^3m^3) or the proposed OSLO project (1.5 t/10^3m^3). The ATC suggests that government should consider the adoption of standards for emissions that reflect a consistent emission to production ratio rather than one based on site-specific or plant-specific technological limits.

This also indicates that technology is significantly improving for the control of SO_x emissions in the oil sands mining region and that there is a need to constantly reassess regulatory limits which are set for existing and future facilities. We would also suggest that there is a strong role for the governments of Canada and Alberta to participate actively with industry in the development, installation and evaluation of enhanced pollutant control technologies for the oil sands mining industry.

4. RESEARCH REQUIREMENTS IN NORTHEASTERN ALBERTA

While the existing base of data does not indicate that regional impacts from acidifying pollutants have, as yet, been detected, there are ample indications that site-specific impacts have occurred (see Syncrude Environmental Monographs and materials discussed through the SERG, DART negotiations.

The ADRP focused heavily on emission impacts in southern Alberta and did not examine, in detail, the northern, boreal forest region on the province. Without information on emissions in the north, the province of Alberta cannot adequately address the long-term consequences of acidic deposition. A joint industry and government research program should be considered to assess potential long-term impacts in northern Alberta.

ATC considers that this research initiative, which could be focused through the RAQCC, should involve all the parties-at-interest in the region including the aboriginal peoples.

Regional interim Target Loadings will have to be verified by this long-term research program and the findings will have to be factored into any future development of loadings which are set for the region.

5. THE REGIONAL AIR QUALITY CO-ORDINATING COMMITTEE MODEL

The ATC considers that the RAQCC represents a model which should be carefully examined by the Alberta government for future application elsewhere in the province. Through the RAQCC model, local participation between Native, government, industry and community representatives can be focused into a problem-solving forum which properly recognizes the interests and limitations of each party. The RAQCC also provides an open forum for the exchange of technical information between the parties within a structured and pro-active setting.

THE RAQCC has demonstrated that long-term cooperation between government, industry and local peoples on air quality management is productive and can lead to resolution of long-standing highly charged issues. The ATC believes that this position would be endorsed by industry and government as well.

6. EXPERIMENTAL PILOT PROJECTS FOR AIR EMISSION CONTROL

The ATC believes that the Alberta government should establish, on a priority basis, an AOSTRA-type agency which will have as its basis for research and development a mandate for the active development and demonstration of pollution control technology at major emission sources in Alberta. It is ou~~t~~r belief that a joint partnership role for the development of pollution abatement control technology, similar to that which already exists for AOSTRA, should be a priority. In addition to the valuable benefits which such a research authority would have for control of emissions in Alberta, significant potential financial benefits could accrue to the province through patent and licensing mechanisms.

indeed, it may allow Alberta to achieve a leadership role in North America in pollution control abatement technology, especially at a time when air quality standards are becoming more stringent, for example the recently approved Air Quality Act in the United States. Technology developed in Alberta could have applications world-wide and could provide a major new industry within Alberta. The ATC recommends that the creation of such an agency be considered on a priority basis.

THE CALGARY CHAMBER OF COMMERCE

OFFICE OF THE PRESIDENT

January 23, 1991

The Honourable Rick Orman, M.L.A.
Minister of Energy
228 Legislature Building
Edmonton, AB
T5K 2B6

The Honourable Ralph Klein, M.L.A.
Minister of Environment
130 Legislature Building
Edmonton, AB
T5K 2B6

Dear Ministers:

RE: Brief to the Clean Air Strategy for Alberta (CASA)

The Calgary Chamber of Commerce is very supportive of the Government of Alberta's initiative in developing a plan to manage air quality in the province. We recognize the air quality issues are inter-related and require the broad view which Alberta is taking. We also appreciate being consulted and believe that all affected parties must be consulted when decisions are being made and we support the government's efforts in this regard.

The Calgary Chamber of Commerce represents over 5,000 individual and corporate members and the issue of air quality and the strategy for ensuring that Alberta continues to enjoy clean air is of concern to the members we represent. We have an active Environment Committee which has been successful in putting forward a number of environmental policy papers at the provincial and national level. Of particular note is the Chamber's endorsement of the policy statement on Sustainable Development, and our efforts to develop policies which build on this principle. We were pleased to be asked to participate in the CASA Identifying Issues and Options Workshop this past fall, and look forward to continuing our active involvement in the development of a clean air strategy for Alberta.

Many of the conclusions resulting from CASA will have far reaching effects on business in Alberta. Thus, there are a number of points we wish to contribute to the process and we trust they will assist with the current deliberations. They are as follows:

Page 2...

517 CENTRE STREET S., CALGARY, ALBERTA, CANADA T2G 2C4 (403) 263-7435 FAX: 266-3413

- As a basis for decision making we encourage that problem definitions, new approaches and policy responses are based on the best available science. Federal Government initiatives to stabilize single gaseous emissions (in carbon dioxide) without recognizing the complex inter-relationships of gaseous compounds, human activities and the economy is an example of political action without due consideration of the ramifications and consequences.

- We support the current initiatives to re-evaluate air quality standards and guidelines in light of current knowledge of atmospheric processes and the growing knowledge of human and bio-physical system responses to air emissions.

- Alberta's air quality initiatives must be in concert with national initiatives and we encourage the Alberta Government to take a lead role in the National Action Strategy on Global Warming.

- Adequate consideration must be given to the social and economic implications of government initiatives, new air quality goals, and new energy efficiency opportunities. The costs, benefits, impacts, and opportunities of new initiatives are an integral component of decision making and will significantly affect the cost of living and doing business in Alberta and Canada.

- Corporate responsibility and commitment is essential to successfully implementing a Clean Air Strategy. The Calgary Chamber of Commerce will make a commitment to inform and educate its membership on the need to make environmentally sound choices.

- We recognize that there will be difficult choices involving trade-offs between environmental quality, life-style, economic growth and energy use. Thus, we encourage the government to inform and educate the public about the implications of these choices. Given the complexity of these issues, the business community in Alberta must be called upon to play a major part in this very important undertaking. We have all contributed to the problem and we, therefore, must all participate in the solution.

- Issues related to the environment and the economy affect the lives of all Albertans and we support the use of a consultation process to collect the views of the citizens of the province. We encourage the

Page 3...

continued use of public hearings and other forms of public input to the decision making process of the government.

As an organization representing a wide cross section of business interests, we appreciate the opportunity to participate in your consultation process. We encourage the government to continue to bring environmental and economic issues to the business community for review and comment.

We look forward to receiving the report summarizing the CASA consultation process, and participating in the spring workshop.

Sincerely,

for

Thomas Cumming
President

TC/TM

c.c. Project Coordinator
Clean Air Strategy for Alberta

CANADIAN UNION OF PUBLIC EMPLOYEES/SYNDICAT CANADIEN DE LA FONCTION PUBLIQUE

November 15, 1990

Clean Air Strategy for Alberta
Bag One, Mail Room, Main Floor,
North Tower - Petroleum Plaza
9945 - 108 Street
Edmonton, Alberta
T5K 2G6

Dear Sir or Madam:

While I do not wish to submit a brief, I have some concerns.

Perhaps my gravest concern is the pollution caused by vehicles. Now I realize that it is impossible to stop this completely, but certainly some things can be done. For example the police or highway patrol should be empowered and encouraged to stop any vehicle which is obviously polluting.

No vehicle should be allowed to be parked and running for any period longer than ten minutes. The large trucks sit not only hours but days at a time running. I made note once of a Facmaster diesel service truck that sat in the Sawridge Hotel, Fort McMurray, parking lot for 4 days running without being moved for that period. I realize that diesel motors are harder to start in the very cold weather, but they can also be plugged in, and in the above case, it was not that cold. Go into any truck stop at any time of year and you will find almost every truck running. The drivers claim that this is necessary to keep the air pressure up. That is not true. It takes no more than 10 minutes to pump up the air. Has there ever been a study done to determine how much pollution is caused by a running diesel?

Truckers also claim that the starting and stopping of diesels is a waste of fuel. I don't know about this, but with a gas engine, 1 minute of idling time uses more fuel than starting it up. We are very fortunate in this province to have reasonably clean air but when on a cold winter day in Fort McMurray, again at the Sawridge Hotel, you are greeted with the diesel fumes from 9 trucks as you walk out the door, the air is not very pleasant.

I urge you to recommend to the government to pass very stringent laws to protect the environment for future Albertans.

Yours truly,

R. Harris/jeb

Royle Harris
National Representative

rh:jeb
opeiu 491

JEFF ROSE
National President/Président national

JUDY DARCY
National Secretary-Treasurer/Secrétaire-trésorière nationale

ED BLACKMAN, ANDRÉ CHARBONNEAU, GERALDINE McGUIRE, TOM O'LEARY, MICHAEL STOKES
General Vice-Presidents/Vice-président(e)s généraux(ales)

EDMONTON AREA OFFICE
10654 - 101 Street, Suite 106, Edmonton, Alberta T5H 2S1 Phone: (403) 426-3430

R01

Caroline Gas Field
Advisory Board
c/o Russell King
R.R. #3
Rocky Mtn. House, AB
TOM ITO

November 14, 1990

Clean Air Strategy for Alberta
Bag One, Mail Room, Main Floor
North Tower, Petroleum Plaza,
9945 - 108 Street
Edmonton, AB
T5K 2G6

Dear Sir,

The Caroline Gas Field Advisory Board is a municipal board of elected and appointed citizens which has been working with industry, government and the ERCB as well as the public since January 1988 regarding the development planning of the Caroline Swan Hills Gas Field. We feel we have represented a broad section of the local public during this process.

We feel it would be appropriate to submit our views on the Clean Air Strategy as it relates to our experience. We have learned that air quality standards in Alberta are as high or higher than any in Canada, North American, or the world. We have confidence in the ERCB and Alberta Environment to licence and enforce these standards. We are also aware that, over time, standards have increased. Therefore we are satisfied with the current state in Alberta and do not feel that air quality is jeopardized by industrial development.

We also have learned that urban air quality is often significantly worse than anything found near rural gas plants. If there is to be a push for cleaner air, we would like to see some to the studies and effort directed toward urban air quality.

Thank you for you attention.

Your truly,

Russell King
Chairman
Caroline Gas Field
Advisory Board

RK/alm

Debby Gregorash
2217 9 St.
COALDALE, AB
T0K 0L0

11 December '90

CASA
Bag 1, Mailroom, Main Floor
N. Tower, Petroleum Plaza
9945 - 108 St.
EDMONTON

I have only one suggestion for CASA. No, three

① Pressure hard to have the automobile manufacturers build smaller cars. There should be no car on the road that gets less than 50 mpg. ② Encourage them also to develop alternate fuels to power these vehicules.

③ Insist urgently that the municiple, provincial and federal governments encourage research and *production* of alternate, non polluting forms of energy for use in homes, offices and industry.

Sincerely,

Debby Gregorash
COALDALE ECOLOGY CLUB

environmentally sound recycled paper

Crowsnest Pass Chamber of Commerce

Box 706

Blairmore, Alta. TOK OEO

ALBERTA CLEAN AIR STRATEGY

As president of the Chamber of Commerce in an area that is largely dependent for its existence on coal production, I am concerned about the recent negative press being directed towards coal production and use as a fuel.

There have been many figures quoted as to what coal burning contributes to the global atmospheric problem, but these figures can also be misleading without closer scrutiny. To say that coal burning emitted 385.8 million tonnes of CO2 into the atmosphere is true, but that coal burning contributed only 1/4 of 1% of the total man-made gases into the atmosphere is also true.

The point here is that we have a history of looking for easy solutions and quick fixes to extremely complex problems. It is easy to point the finger at coal burning because it emits more CO2 per unit of enery that does oil or gas, so the assumption is that if we quit burning coal, all our problems will be solved. Unfortunately, it's not that simple.

Over the last 20 years, we have had many rash but widely accepted assumptions made that later proved to be premature at best, and totally false at worst. We have wasted an enormous amount of time and money chasing impossible solutions in our travels since the 60's from LSD to CFC's. In the early 70's, stagflation was the magic word, where our total economic system was headed for collapse. Then OPEC came along, and caused a panic over "non-renewable resources". By 1980, however, oil was selling at over $35 and we were suddenly OK again. Then the recession hit and everyone was predicting the death of several major industries, the auto industry among them. Unemployment was rampant. and calls for major government shifts to socialism was called for to cure the blight. At the same time in the early 80's winters in the northeast US were unusually harsh, and warnings of a new ice age that would crush our major cities under ice and snow were given. We were powerless against the freezing power of nature. Then we heard about Nuclear Winter, where amid the sabre rattling of Reagan and Haig, if the bomb itself didn't get us, the Nuclear Winter would as the sun disappeared behind the clouds of dust and ash. Now instead of an ice age, we fear global warming. We will melt the polar ice caps by production of CO2 and destroy life forms by exposing them to radiation resulting from ozone depletion.

My point here is not to deride the environmental concerns, but simply to recommend a more scientific and less emotional assessment of this latest threat. Don't forget that over one hundred billion dollars was spent in the US to remove asbestos from all public buildings before a subsequent study found that to be unnecessary.

When we consider the magnitude of economic and social cost we face in the battle against environmental degradation, we cannot afford to keep attacking the wrong foe. When you consider: that CO2 is extremely abundant, that we do not really know how our ecosystem will handle a large build-up, that there are a huge number of man-made sources of CO2, that the costs of radical change are astronomical, we MUST, MUST, MUST make the crucial decisions very carefully. To get caught up in some kind of international competition to see who can be the most "environmentally friendly" place in the world could be ruinous.

Regarding coal burning, like it or not, the world is going to be burning more coal 20 years from now than it is today. Coal produces 30% of the world's primary energy, second only to oil. It generates 44% of the world's electricity, and used in the production of 75% of the world's steel. Over 250,000 consumer products are derived from coal or its chemicals.

What kind of growth can we expect in the demand for energy? In 1987 there were 5.6 billion people on the earth. Forty years later the population will be 8.2 billion, with 90% of the growth in developing countries. Every new person will consume energy at the same time as striving to improve their lives, which can only be accomplished through the use of energy. Where is this all going to come from?

Look at the global sources of energy. Worldwide, we have a 40 year supply of oil, a 60 year supply of natural gas, and at least a 220 year supply of coal. Can we honestly assume that developing countries will oil and gas for much more than domestic and transportation fuel, or that they will be able to afford or cope with nuclear energy? I think not. Therefore, not only can we not live without coal now, we will surely be living with it in the future. The question is then not how to eliminate coal, but to learn how to live with it.

When the problems of acid rain and particulate emission became evident, technology was developed to handle them. The technology has not been universally implemented as yet, mainly due to intergovernmental problems, but as late as last week, major steps are being taken for implementation. A paralell situation exists with CO2 emissions. Research has already begun into ways of reducing CO2 emissions, by recapturing and using the CO2 in a process called Integrated Gasification Combined Cycle, or IGCC for short. This is a process by which pulverized coal is turned into a gas, cooled, and then the sulphur and CO2 are removed. The clean coal gas then fuels a gas turbine, and waste heat is used to fire a steam turbine, each of these turbines generating electricity. The sulphur is collected for industrial use, and the CO2 is likewise collected and used. This whole process will result in the cleanest coal -based electricity possible.

Unlike the many issues facing other energy related industries, there are few issues facing the coal industry. Surface mining, now the most common type is safer than any of the other energy industries, there is a very high level of reclamation of land being carried out compared to other industries, and 98% of our coal reserves are of a very low sulphur content. So, other than the production of CO2, the solution to which is well on its way to being solved, the coal industry is continues to be one of the most environmentally friendly sources of energy. Some of the older generating plants continue to pollute, particularly in Eastern Canada, however, in large part that is due to the burning of high sulphur US coal. With new initiatives on both sides the US border, combined with the political will to have Eastern Hydro plants burn cleaner Western coal, some of our environmental concerns with coal burning are already being addressed. While continued vigilance combined with continued research are contributing to much better environmental results, we all realize that there is much yet that can be done. It is important, however, that we do not over-react, which could in fact derail the process instead of hurrying it along.

Thank you

D Burgman

Dick Burgman, President
Crowsnest Pass Chamber of Commerce

90-12-12 - xc to WEST
Les [illegible]

ECOCITY
SOCIETY
Box 205 Edmonton Canada T5J 2J1
Phone (403) 429-0766

Nov. 22, 1990

Dear CASA Folks:

I'm sorry that I missed the opportunity to make a public presentation last week. I had an earlier engagement, and had understood that the proceedings would continue until at least 10 p.m. However, by the time I had arrived the show was over.

I enclose a copy of my presentation to be considered in your deliberations. I look forward to working with you in the future.

Sincerely,

Tooker

Tooker Gomberg
Director

EcoCity
SOCIETY
Box 205 Edmonton Canada T5J 2J1
Phone (403) 429-0768

PRESENTATION TO THE CLEAN AIR STRATEGY FOR ALBERTA

Nov. 16. 1990

presented by Tooker Gomberg

Thank you for the opportunity to make this presentation today. I am here on behalf of the EcoCity Society. a not-for-profit society which aims to raise awareness about ecological concerns. and propose positive ecological alternatives.

I thought about bringing a car in here today. and turning it on to make a point which I suppose is obvious. That is. in a room containing a limited amount of air we'd be poisoned by the car. And on a planet with over 400 million of the beasts. we're doing just that.

The topic of discussion tonight is clean air. And one has only to look at the horizon to see that clean air is eluding us. Our cities are heavily polluted. and the pollution is directly linked to automobile tailpipes.

Cars are the greatest contributor to the environmental mess we're in. I will attempt to elaborate on that statement. and articulate some directions for cleaning up the air via ecologically sustainable transportation.

I believe that there is a profound change in public mood underway. People are concerned about the health of the environment like never before. At the supermarket the green choices are being made. It's now time for the politicians and the civil servants to make green decisions.

No longer can policies be determined only on the basis of dollar costs and political expediency. It is your duty to consider the effects of those policies on the health of people. our communities. and the planet itself.

The decisions of the past cast a deep shadow on our yearning for healthy communities. The results of automobile based decisions are now playing themselves out. Our pocketbooks are assaulted by the automobile. and so are our senses. The noise pollution raises stress levels. the ugly smudge of smog brings tears to our eyes. and the smell of exhaust burns the lungs. The American Lung

Association. not your typical radical environmental organization. estimates that worldwide as many as 120.000 premature deaths may be linked to motor vehicle exhaust.

If we are to achieve sustainable development. that is development that does not rob from future generations. then we must look carefully and fully at ways to reduce and eliminate the need for the private car. We can no longer treat the earth as a dirty room. expecting Mother Nature to come and clean up after us.

The car is the single greatest polluter in our cities. It consumes great quantities of energy. It's said that transportation uses 1/4 of all the energy in Canada. but it's probably closer to 40% when you include building the highways. refining the fuels. manufacturing the cars. etc. Cars alone probably use 20% of the energy in this country.

Cars cause terrific damage and destruction. injury and death. And they're a significant contributor to global environmental problems of climate change. the ozone hole. and acid rain. They contribute to asthma and lung problems in our cities. and cause noise pollution and stress.

Transportation is the mechanism we use to get from here to there. But we could actually reduce the need for transportation altogether. For example. if cities are poorly designed. we'll need to drive five miles to pick up a litre of milk. But communities can be designed to reduce the need for travel so that amenities are available locally. So too could the province be planned. so that the actual needs to travel are reduced.

For instance. electronic meetings could often take place. instead of physical meetings.

When transportation systems are needed. they must be integrated with the other transport systems. That means that the bus station is right next to the train station. and there are adequate links with other modes like local public transportation.

It also means that walkers and cyclists must be treated with respect. People who are travelling need showers and benches. washrooms and ramps.

Bicyclists need secure and convenient bicycle parking. They need access to trains and buses. Bike-and-ride systems have been very successful in the Netherlands. Denmark. Japan and West Germany. In many European cities 40% or more of the trips are by bicycle.

.../3

It's extremely cost efficient to build bicycle lanes and routes for direct efficient utilitarian bicycle use. The demand is there, where are the facilities?

The number of cars in Canada has tripled in the last 30 years. This is not because the car is the best way to go. It is thanks to a tilted playing field, where massive infusions of public money have gone into propping up the road and car support infrastructure. The Worldwatch Institute estimates that if car drivers paid the true costs of their vehicles, including road building and maintenance, ambulance and police costs and so on, they'd be paying an extra $3,000 per year!

Today the average motorist already pays $6,000 or so for the vehicle, its maintenance, insurance, and fuel. The auto companies spend $5 billion per year hawking their product. If it was so good would we be assaulted by all this glossy advertising?

I don't believe that people are happy spending one in four of their working hours paying for a vehicle which is so destructive. When the alternatives are there, people use them. In many European countries which tax gasoline and subsidize public transportation, people choose to leave their cars at home and take the train or the bus instead. But the alternatives need to be there.

That one cannot get to Kananaskis Park by public bus forces one to drive. That there is no high speed train from here to Calgary is not only an insult to a healthy ecology, but it's an insult to our specie's intelligence.

The ecological costs of what we're doing are staggering. Acid rain is already affecting 80% of Quebec's sugar maples, and may be contributing to lung cancer. We're being told that we must cut carbon emissions by 50%, but we're driving like there's no tomorrow. At least 30% of the carbon dioxide pollution comes form transportation sources. The average car pumps 5 - 6 times its own weight of CO2 into the atmosphere annually.

And of course, relying on cars means that we'll go to almost any extreme to get the oil. Be it war in the Persian Gulf, befouling the Grand Banks off Newfoundland, or threatening the Artic ecosystem. There's little money for Via, but literally billions for energy megaprojects. Haven't we heard promises that the environment would be given equal treatment to the economy?

Space concerns are also important: a light rail line can carry 70 times as many people as a highway.

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In conclusion, I recommend that CASA dedicate time and resources to explore the fundamental role that transportation plays in the quality of air in Alberta.

I urge that the ecological costs of transportation have the highest priority. Following from this, that transportation is not necessarily a "good thing", and that ways to reduce transportation should be fully explored.

Ecological modes should get high priority. In urban cores the pedestrian should have priority, followed by bicyclists and public transport. Inter-urban travel would generally favour busses over airplanes, trains over buses. Private car travel should be actively discouraged, and subsidies removed.

That energy efficiency be a priority for research and development in the transportation field.

Some other specific suggestions:

-compile data on the European experiences with urban bicycle use and how such systems might be transplanted in Alberta cities

-explore the experience in European cities with slow streets and traffic calming measures to make cities more "people-oriented"

-approach the United Nations Healthy Cities Project for innovative measures to clear the air via innovative transportation measures

-explore air quality initiatives via the U.N. International Council for Local Environmental Initiatives

-ensure that all railway rights of way are preserved for future use as rail corridors, and/or as bicycle corridors.

-ensure that the ecologics of transportation options receive thorough consideration and support.

-ensure that all transportation modes are accessible and friendly towards bicycles.

-ensure that different transportation modes be designed so that they fit together both in terms of space and in terms of timetables.

-that rail links be established between all major urban and suburban areas.

Thank You.

GRASSLAND NATURALISTS

c/o 144 - 12 Street S.E.
Medicine Hat, AB T1A 1V1

January 13, 1991

Clean Air Strategy for Alberta
Bag One, Mail Room
Main Floor, North Tower, Petroleum Plaza
9945 - 108 Street Edmonton, Alberta
T5K 2G6

The Grassland Naturalists are a group of about eighty people in Medicine Hat and the surrounding area. We have a wide variety of members with a corresponding variety of interests and expertise. We are involved in natural history related activities such as bird counts and bluebird trails, as well as environmental projects such as commenting on proposed environmental legislation and the clean air strategy.

We appreciate the opportunity for groups such as ours to contribute to the planning and discussion which will affect the quality of our life. Air is one of the basics of life, and of course, clean air is a basic for the high quality of life that we in most parts of Alberta enjoy.

We are very optimistic that the input you receive on this project will demonstrate the importance of clean air to Albertans, and provide the momentum to forge ahead implementing these ideas.

Yours truly,

LORINE MARSHALL

Lorine Marshall
President,

GRASSLAND NATURALISTS

c/o 144 - 12 Street S.E.
Medicine Hat, AB T1A 1V1

Presentation to the

CLEAN AIR STRATEGY FOR ALBERTA

January 13, 1991

Prepared by Corlaine Gardner, Vice-President

The Grasslands Naturalists welcome this opportunity to bring forward our concerns about air quality. Many of our members compiled their ideas which our Clean Air Committee then reviewed. In general, we have quite good air quality. The major areas of concern were emissions from cars, the lack of research and development of alternate energies, the lack of education in conservation, and public buildings as polluters rather than models of healthy air quality. The condensed points on these topics are presented here.

Alberta Conservation Strategy

Before discussing detailed suggestions, we would like to make some general comments about our province's Conservation Strategy. This document, still being developed, shows promise of giving some leadership to our environmental movement. Indeed, if it is endorsed by the government, it could provide leadership to all aspects of our lives.

The Strategy's three stages to conflict resolution - education, incentives, regulation - should be adopted immediately. Education will be an on going and never ending job, so the sooner we get on with it, the better.

We agree that the person deriving benefit from the action should also pay the cost of avoiding pollution. This should hold true for everyone, from car owners to natural gas producers.

Transportation

Almost every one involved identified cars as a major problem for air pollution. We recognize that we need transportation for ourselves, and for the products that we produce and consume. There are a variety of ways to improve the amount and type of pollution from cars. The solutions proposed by our members range from major budget changes to individual actions. All of them would improve and protect our air.

-We should budget as much for conservation and mass transit systems as we do for highway construction and maintenance.

-Discourage people from driving

    -by eliminating parking subsidies
    -by increasing licence fees for second or third cars in a family.
    -by educating people to the alternatives such as car pools, mass transit, walking,

-Emission standards should be raised to the highest level possible. We believe that California has the toughest standard at present. If the car companies can build to those standards for California, they can build to those standards for us.

-All government vehicles should be converted to cleaner burning fuels. Private vehicle owners should be encouraged to follow suit.

Alternate Energy Sources

We need a change of attitude at the government level. Government publications regarding wind and solar power dismiss the potential because of our cheap natural gas. That is a very short-sighted view, especially since free trade guarantees Americans access to our gas.

Research and development of non polluting alternative energy sources now will allow us to gradually decrease use of non-renewable, polluting energy sources. If we don't invest now, we may find ourselves paying higher and higher prices and then scrambling for poorly developed solar and wind technology.

Incidently, we do not support the City of Medicine Hat's promotion of methanol as an alternate fuel. The conversion from methane to methanol is very inefficient. The natural gas could be burned directly more efficiently.

We need a lot more government funded research right now.

Education

We need a change of attitude at the personal level, and it is happening! Individuals are becoming more and more aware of their own impact on the environment. Many people become discouraged by hearing all the problems. Information and education should stress the positive. Give people realistic alternatives rather than telling them how horrible things are. Point out the benefits of reducing energy demands; lower heating, electricity, and gasoline bills, better health through decreased use of the car, increased enjoyment of life.

We need education, not public relations. Information should give concrete suggestions for energy savings and should be based on long term views.

Buildings

Buildings, by their inefficient use of energy, poor design, or poor maintenance, contribute to deteriorating air quality. Indoor air pollution can be as big a problem as outdoor air pollution.

All publicly owned buildings should be analysed by Alberta Energy's Conservation Van, and the recommendations implemented as soon as possible.

All public buildings being planned should use
-passive solar heating and cooling,
-natural lighting wherever possible,
-efficient heat exchangers to reduce heat loss while providing ventilation for indoor air quality,
-non-polluting materials such as tile, and natural wood. Many modern construction and decorating materials give off gases such as formaldehyde.

Electricity production

Coal burning plants should be phased out. There should be strict enforcement of emission levels. In fact those levels should be reviewed and lowered as modern technology permits.

Industry

When new factories are built, or existing ones expand, a small portion of the investment should be added to a new environmental fund. This will be used, at the discretion of the government or a university, for environmental protection research.

All industries should have mandatory environmental audits on a regular basis. The frequency of audits could be graded by the environmental hazards of that particular industry.

Government

Our major recommendation for the Clean Air Strategy For Alberta is that the Alberta Government lead by example.

The provincial government has a lot of employees, vehicles, and buildings. If energy saving solutions were applied within the government, there would be an improvement in air quality. Better still, there would be an excellent example for private industry and the public to follow. Certain departments could be used as case studies for implementing these solutions. Different public buildings could be part of on going research programs for solar and wind energy development. The opportunities are there for some real progress. And it would be great public relations!

Conclusion

We enjoy our clean air and want to continue to do so. Taking a long term view and implementing energy saving, air quality protecting ideas now will maintain our fresh air and improve the less pristine air of other parts of Alberta.

CLEAN AIR STRATEGY
DECEMBER 13, 1990

I WOULD LIKE TO ACKNOWLEDGE AND CONGRATULATE YOU ON YOUR EFFORTS REGARDING THE ENVIRONMENT. THE FUNDAMENTAL PHILOSOPHY OF MY PEOPLE, THE BLACKFOOT IS AS FOLLOWS: " **THE CREATOR ENTRUSTED OUR MOTHER EARTH WITH THE RESPONSIBILITY OF PROVIDING FOOD, CLOTHING, AND SHELTER TO HIS CHILDREN, THE REAL PEOPLE. (THE REAL PEOPLE BEING THE BLACKFOOT) HIS CHILDREN ARE ENTRUSTED TO MAINTAIN HARMONY AND BALANCE WITH ALL THE WINGED ONES, FOUR LEGGED ONES, ALL THE ONES WHO LIVE IN THE WATER, AND ALL THAT GROWS UPON OUR MOTHER THE EARTH."** IT IS HEART WARMING TO MYSELF AND MY ANCESTORS THAT YOU MY BROTHERS AND SISTERS AFTER 500 YEARS HAVE DISCOVERED WE SHARE A COMMON PHILOSOPHY.

I TAKE THIS OPPORTUNITY TO INFORM YOU OF OUR EFFORTS:

1. ENCOURAGE USE OF ENVIROMENTAL FRIENDLY PRODUCTS:
    - Use of Cloth Diapers
    - Breast Feeding
    - Use recycleable products

2. INDIVIDUAL EFFORTS:
    - Dispose of domestic garbage in proper manner
    - Dangerous products disposed
    - Teach and Encourage children to be enviromental Conscience

3. ENCOURAGE OUR YOUNG PEOPLE TO ENTER INTO THE OCCUPATIONS THAT HAVE TO DO WITH TAKING CARE OF MOTHER EARTH. THIS IS SOMETHING THAT OUR ELDERS ARE VOICING AT THEIR CONFERENCES.

4. ESTABLISH AND MAINTAIN DIALOGUE WITH GOVERMENT DEPARTMENTS AND AGENCIES TO COMPLIMENT AND ENHANCE PROTECTION OF OUR MOTHER THE EARTH.

5. REVITALIZE AND ENCOURAGE OUR PEOPLE OF OUR TRADITIONS AND BELIEFS THAT PERTAIN TO OUR ENVIRONMENT.

6. PUBLIC EDUCATION BEING PROVIDED BY TELEVISION AND RADIO IS HELPFUL WITH THE EXPOSURE OF SERVICES AVAILABLE AND PRACTICAL KNOWLEDGE: (eg. Not running water but filling a cup, to dispose of paint cans, etc.).

PREPARED AND SUBMITTED BY:

Holy Roads Woman
HOLY ROADS WOMAN
CAROLINE YELLOW HORN
NORTH PEIGAN - BLACKFOOT CONFEDERACY.

PEACE RIVER HEALTH UNIT No. 21

Main Office: Box 6178 PEACE RIVER, ALBERTA T8S 1S2
Telephone: 624-3611

File No. 0185-H1-5

January 08, 1991

Clean Air Strategy for Alberta
Bag One, Mail Room, Main Floor
North Tower, Petroleum Plaza
9945 - 108 Street
EDMONTON, Alberta
T5K 2G6

Dear Sir/Madame:

Please find enclosed a brief on the Clean Air Strategy for Alberta, which is being presented by the Health Unit Association of Alberta (North Zone).

Sincerely

D. Lindskoog
Chairman of the North Zone

cc: Chairman - Northwestern Health & Social Service Board
Chairman - South Peace Health Unit Board
Chairman - Peace River Health Unit Board
Chairman - Athabasca Health Unit Board
Chairman - Fort McMurray Health Unit

Enclosures

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BRIEF ON

CLEAN AIR STRATEGY FOR ALBERTA

December 1990

Presented by

North Region

Health Unit Association of Alberta

Athabasca Health Unit
Fort McMurray & District Health Unit
High Level - Fort Vermilion Health Unit
Peace River Health Unit No. 21
South Peace Health Unit

CLEAN AIR STRATEGY FOR ALBERTA

THE OVERVIEW OF THE CLEAN AIR STRATEGY FOR ALBERTA STRESSES THE ECONOMIC FACTORS AND ALBERTA'S ROLE AS A MAJOR PRODUCER OF ENERGY RELATED EMISSIONS. THE IMPACT ON HUMAN HEALTH AND THE NEED TO RELATE ENVIRONMENTAL IMPACTS TO THIS ISSUE IS ABSENT. THE BOTTOM LINE IS HOW DOES THE QUALITY OF AIR AFFECT MY HEALTH AND WHAT HAS TO CHANGE IN THE AREAS OF ENERGY PRODUCTION AND ENERGY USE THAT WILL LEAD TO IMPROVED HUMAN HEALTH.

WE BELIEVE IT IS ESSENTIAL TO CONDUCT BASELINE AND CONTINUING STUDIES TO MEASURE THOSE SUBSTANCES WHICH ARE OR MAY BE A FACTOR IN HUMAN HEALTH. THE BASELINE STUDIES SHOULD COVER AIR AS WELL AS WATER (BOTH SURFACE AND GROUNDWATER) AND SOIL.

THE STUDIES ON THE AIR SHOULD IDENTIFY THOSE SUBSTANCES WHICH ARE OCCURRING NATURALLY AND THOSE SUBSTANCES WHICH HAVE BEEN INTRODUCED BY HUMAN ACTIVITY. PREVAILING WINDS MUST ALSO BE CONSIDERED IN DEFINING THE STUDY AREA.

A PRIME AREA OF STUDY IS OF THE HEALTH STATUS INDICATORS OF THE HUMAN POPULATION WITH LINKAGES TO THE QUALITY OF THE AIR WE BREATHE.

The government of Alberta, the Northwest Territories and Canada are currently reaching an agreement on a model for conducting the Peace/Athabasca Slave Basin Technical Studies. Current study design includes water quality, fish and wildlife, hydrology/hydraulics and water - use sub study components. The opportunity to incorporate Air Quality into the major study would provide information that could be used as a baseline for future study of insults to the quality of our air.

Air respects no boundaries and the pollutants carried in the air eventually effect all of us. No corner of the world is safe from the impact of acid disposition, energy related gases and the end product; negative impacts on human health.

In closing, we emphasize that the Clean Air Strategy for Alberta must include the impacts on human health in all its aspects. The consequences of indiscriminate industrial development without consideration for human health is very evident in the Eastern European Countries. The end product is a sick environment and sick people. We have the opportunity of taking a holistic approach and the Health Units in Northern Alberta have identified a vehicle that makes the establishment of baselines possible, and we can monitor the introduction of increasing numbers of pollutants that are affecting the quality of our air. A collaborative approach to the elimination of pollutants is then based on scientific data and the health status indicators will be able to measure the result of action or inaction.

MOTOR VEHICLE EMISSIONS MONITORING AND REGULATION: A SURVEY OF OTHER JURISDICTIONS AND SUGGESTED REFORMS.

by University of Calgary
Environmental Law Group
1990

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IV. APPENDIX

(a) UNEDITED VERSION OF THE PROPOSED LEGISLATION

(b) RELEVANT CANADIAN LEGISLATION

(c) RELEVANT AMERICAN LEGISLATION

This paper is designed to provide an overview of existing motor vehicle exhaust emission legislation in North America. The intent is to suggest reforms to the present situation that exists in Alberta.

Recently, the Alberta government requested submissions as to how to improve existing environmental legislation in the province. One area in which Alberta is noticeably deficient relative to other jurisdictions is in the area of motor vehicle emissions legislation. It has long been recognised that auto emissions produce a number of harmful effects to the environment. These effects are most prevalent in larger cities. Alberta now stands as one of the last provinces in Canada which has large cities - namely Calgary and Edmonton - that does not have emissions legislation. The impact on these cities is growing constantly as the traffic volume increases, and it is now also clear that auto emissions affect the environment far beyond these cities and indeed Alberta by adding to the "greenhouse effect" and by destroying the ozone layer among other detrimental effects. It has also been recently reported, although I could not obtain a citation at the time of this paper, that one half of Canadians are regularly exposed to ozone levels - produced primarily from motor vehicles - that are dangerous to their health.

It is for the above reasons that this paper was written. The remainder is devoted to a review of North American legislation in the area and a proposal for reform in Alberta.

SURVEY OF EXISTING LEGISLATION

Copies of the legislation from each of the jurisdictions discussed are contained in the attached appendix.

CANADA

FEDERAL:

The federal government controls motor vehicle emissions in two ways. Firstly, it controls emissions indirectly by controlling the additives which can be placed in motor fuels through the Clean Air Act, R.S. 1970-71-72, c.47, s.22-23. For example, it is eliminating the use of lead as an additive to motor fuels at the end of this year. The second method of control is more direct. The federal government places direct controls on manufacturers of motor vehicles by the establishment of standards under the Motor Vehicle Safety Act, R.S.C. 1970 (1st supp.) c. 26. Regulations made under the Act prescribe standards for various vehicle component emissions including the exhaust system, crankcase and fuel system (Motor Vehicle Safety Regulations, S.O.R./70-487). Four types of emissions are regulated:

1. Crankcases or gasoline engines must be constructed and capable of maintenance to eliminate crankcase emissions.

2. Maximum standards are specified for hydrocarbons, carbon monoxide and nitrogen oxides in exhaust emissions of light and heavy duty vehicles.

3. Opacity of exhaust emissions of diesel powered heavy duty vehicles must not exceed 20 percent during acceleration, and 15 percent during lugging.

4. Evaporative emissions from gasoline powered light duty vehicles with engine capacity in excess of 50 cubic inches, must not exceed 2 grams of hydrocarbons. (Taken from Canadian Environmental Law, Law - issue 0, section [4.2.1.2], p.470.)

Alberta:

There is no established legislation in Alberta that directs itself towards automobile emissions. The most likely statutes to contain such restrictions - the Clean Air Act, R.S.A. 1980, c.C-12, and the Highway Traffic Act, R.S.A. 1980, c. H-7 - do not even have any restrictions on the amount of smoke a vehicle is permitted to produce.

British Columbia:

This province has established provisions under its Motor Vehicle Act, R.S.B.C. 1979, c.288. It restricts

1. the sale of motor vehicles which do not meet emissions specifications;

2. the use of a vehicle that has disconnected or improperly functioning emission control equipment.

The maximum fine under the section is a $500 dollar fine.

Manitoba:

The entirety of Manitoba's vehicle emissions legislation amounts to one section, section 179(1), of their Highway Traffic Act, S.M. 1985-86, c.3-Cap. H60. The relevant subsection states:

> 179(1) No person in control or charge of a motor vehicle shall,
>
> (b) Permit any unnecessary amount of smoke to escape from the motor vehicle.

This legislation is almost as weak as the restrictions in Alberta, although Alberta does not even have this prohibition.

New Brunswick:

Provisions exist within the Motor Vehicle Act, R.S.N.B. 1973, c. M-17, s. 235, 248-250, and Inspection Regulations, N.B. Reg. 83-185, s. 6, for testing, inspection and certification of vehicle emissions equipment. There are no specifications for amounts of emissions permitted, but there is a requirement that engines must be equipped and adjusted to prevent the escape of excessive fumes or smoke.

Newfoundland:

Dealers are restricted from selling new motor vehicles in Newfoundland if the vehicles do not meet the emission standards within the Federal Motor Vehicle Safety Act or if they fail to conform to other requirements required by regulations set by the Minister of Transportation and Communications. There are provisions for motor vehicle inspections, but needless to say, emission standards for used vehicles are not regulated, probably due in part to the control the Minister of Transportation and Communication and not the Minister of the Environment.

Nova Scotia:

The situation in this province is very similar to Manitoba's. Their Motor Vehicle Act, M-22, s. 169 is almost exactly the same as Manitoba's and no emissions legislation exists in other provincial statutes.

Northwest Territories:

Once again, legislation in this province amounts to a restriction on unnecessary smoke (Highway Traffic Act, c. 24 (1987), s. 154, p.436-viii, No. 2.).

Ontario:

Ontario has the most extensive legislation regulating motor vehicle emissions in Canada. Unfortunately, this is not as great an honour as it could be though. Ontario, though Part III of its Environmental Protection Act, Chap. 141, Ont. Stat. Cit., and the accompanying regulations (Motor Vehicles Regulation, R.R.O. 1980, Reg. 311) places emission requirements on all motor vehicles, both new and used. Unfortunately, the legislation does not require an inspection unless you are given written notice by a police officer or provincial officer to report for an inspection. This, in effect, means that the only vehicles that are inspected are those that are suspected of exceeding the requirements. This is probably a less effective method of meeting the problem of exhaust pollution than is possible by employing methods used in many of the American states, but this will be discussed later (see "Proposed

Legislation" below). Ontario's legislation also prohibits the use of leaded fuel in vehicles equipped with catalytic converters, the sale of vehicles that do not meet emission standards, the removal of emission control devices or operation of vehicles that have the device removed, the production of excessive smoke by a vehicle, and the removal of gasoline tank filler inlets in vehicles that use unleaded fuel.

Prince Edward Island:

This provinces Highway Traffic Act, R.S.P.E.I. 1974, c. F-8, s. 42, provides that no driver shall permit an unreasonable amount of smoke to escape from a motor vehicle. This is the only limitation on exhaust emissions in the province.

Quebec:

The legislation in this province is in a state of flux. There are statutory provisions allowing the Lieutenant-Governor in Council to make regulations to prohibit or limit certain classes of vehicles and to determine maintenance of engines including provisions for inspections (Environment Quality Act, c. Q2, 1977, revised C-64, 1978, s. 50-53). At this time, however, no such regulations have been enacted. Draft regulations have been proposed, according to Canadian Environmental Law, Law-issue 25 (May/83), section [4.8.1.2.1], p. 537, that "would establish standards for hydrocarbon, carbon monoxide, and nitrogen oxide exhaust emissions, for hydrocarbon content of evaporative emissions and for opacity of diesel vehicle exhaust emissions". Other aspects of the legislation which are in force can be found in Division XXX.1 and XXX.2 of the Quebec regulations (added by O.C. 240-85, s. 8 and found in No. 3 - May 1985 at p. 107.0). They include restrictions on the sale of post 1985, light duty new and used vehicles that are

(a) not equipped with emission control devices that are in good working order, or

(b) not in compliance with federal emission standards.

There is also a restriction on the removal of any emission control device. Another aspect of the legislation to note is that alternatively fuelled vehicles (using 100% propane or natural gas) and competition vehicles (racing cars) are exempted.

THE UNITED STATES

ALABAMA:

Provisions in this state include:

1. visible emissions restrictions- all vehicles, 20% opacity for 5 seconds;
2. r.p.m.'s , ignition timing, and cylinder firing must comply with manufacturer specifications;
3. crankcase ventilation systems specifications;
4. emission control system specifications and maintenance procedures;
5. evaporative loss control systems must be maintained;
6. anti-tampering provisions;
7. applies to all gas-powered vehicles manufactured after 1967.

ALASKA:

Provisions in this state include:

1. visible emissions restrictions- for gas powered, no visible emissions for greater than 5 seconds; for diesel powered, 40% opacity for more than 5 seconds.

ARIZONA:

Provisions in this state include:

1. applicable to all vehicles under 6000 lbs;
2. annual inspections required in populated areas 90 days or less prior to registration of vehicle;
3. car dealers must pay for inspection of vehicle they are selling;
4. stickers issued for windshield if comply with standards;
5. inspectors must recommend repairs if vehicle fails test;
6. if repairs cost over a certain amount (depends on vehicle), will get waiver;
7. must get low emissions tune up if fail initial test;
8. $10 maximum inspection fee;
9. one free reinspection if fail initial inspection;
10. independent contractors are licensed to be inspectors.

ARKANSAS:

There appears to be no vehicle emissions legislation in this state.

CALIFORNIA:

California has the most restrictive laws regarding motor vehicle emissions in North America. Provisions found in California Law include:

1. manufacturers must repair systematic defects in vehicles;
2. standards apply to off highway vehicles, construction and farm machines, motorcycles, trains, utility engines and boats

as well;
3. strict rules on the manufacturer's- inspectors conduct surveillance at assembly plants;
4. manufacturers must warranty emissions equipment and vehicle emissions standards for 3 years or 50 000 miles and have a partial warranty for 7 years or 70 000 miles;
5. can require the installation of new devices in vehicles;
6. inspections required on new vehicles and each time they are registered;
7. private stations conduct inspections;
8. police can conduct a tampering inspection;
9. visible emissions restrictions- heavy duty vehicles subject to $1500 fine;
10. standards set so that only 5% of vehicles would fail;
11. minimum of $50 must be spent on repairs to get waiver;
12. testing and inspection equipment must be tamper-resistant and give simple pass/fail readings;
13. garages cannot require a person to undergo repairs at that garage as a precondition to testing.

COLORADO:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. seller of vehicle is responsible for the cost of inspection to have car reregistered;
3. if repair parts are not available, can have vehicle temporarily certified;
4. waiver if spend certain amount on repairs, but not if vehicle is under warranty;
5. repairs eligible for waiver are specified;
6. kit cars are exempted.

CONNECTICUT:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. only applicable to vehicles manufactured since 1968;
3. one year exemption for new vehicles if they meet federal standards;
4. must maintain emission standards between inspections- if do not, have 30 days to repair or registration will be revoked;
5. if repairs cost more than $40, waiver is granted;
6. independent contractors, but not repair stations, are licensed to do inspections;
7. $10 maximum fee for inspection;
8. one free reinspection within 30 days if vehicle fails initial inspection;
9. $35 fine and registration is cancelled if vehicle is not maintained to meet standards.

DELAWARE:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. only gasoline powered vehicles are subject to legislation;
3. waiver if repairs would be too costly (more than $75).

DISTRICT OF COLUMBIA:

Provisions in this state include:

1. vehicles are not permitted to idle for more than 5 minutes (subject to some exemptions);
2. visible fumes are not permitted for more than 10 consecutive seconds;
3. all vehicles are subject to the legislation.

FLORIDA:

Legislation in Florida is scheduled to take effect as of January 1, 1991. Provisions in this state's impending legislation include:

1. must have vehicle inspected 90 days prior to registration;
2. temporary, 1 year exemption granted if vehicle is out of the state for the 90 days prior to registration;
3. applies to all vehicles manufactured since 1975;
4. new vehicles are exempted for 1 year;
5. privately run inspection stations, but can not perform repairs;
6. waiver if a minimum of $100 is spent on repairs;
7. exemptions will be granted to those suffering financial hardship;
8. no charge for one reinspection if vehicle fails initial inspection;
9. any repair shop can be licensed to reinspect;
10. an inspection certificate is not a warranty as to the mechanical condition of the vehicle.

GEORGIA:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. all vehicles which were manufactured in the last 11 years are subject;
3. only applies in populated areas;
4. if vehicle fails initial test, have 15 days to repair and have reinspected;
5. waiver granted if spend a minimum of $50 on repairs;
6. new vehicles are granted a 1 year exemption;
7. inspection fee is a maximum of $10;

8. any garage can be licensed to perform inspections;
9. there is a prohibition on tampering- each day of violation is a separate offence;
10. fines for contravening the legislation range from $25-$100;
11. vehicles may not produce visible emissions for longer than 10 seconds- violation results in a $10-$25 fine.

HAWAII:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within Hawaii's motor vehicle legislation and are not included in the appendix.

IDAHO:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within Idaho's motor vehicle legislation and are not included in the appendix.

ILLINOIS:

Provisions in this state include:

1. absolutely no visible emissions are permitted from any vehicle (except diesel powered);
2. this restriction is extended to train locomotives (except in certain circumstances).

INDIANA:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. only applies in populated areas;
3. recreational vehicles are exempt;
4. motor vehicles are exempt if they were manufactured more than 14 years ago;
4. new vehicles are exempt for 30 days;
5. waivers are granted if a low emissions tune up is performed and if repairs amounting to $50 in parts or $100 in parts and labour are performed, but only if there is a 40% improvement in emissions reduction;
6. must maintain emissions standards between tests;

7. 30 days waiver granted to complete repairs;
8. additional time is granted if parts are unavailable.

IOWA:

There appears to be no vehicle emissions legislation in this state.

KANSAS:

There appears to be no vehicle emissions legislation in this state.

KENTUCKY:

Provisions in this state include:

1. an initial test must be performed by the manufacturer of any vehicle that runs on propane- emissions must meet requirements;
2. the above provision also applies to vehicles that have been converted to propane.

These requirements are in place because individuals owning propane vehicles in Kentucky receive tax benefits.

LOUISIANA:

There appears to be no vehicle emissions legislation in this state.

MAINE:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within Maine's motor vehicle legislation and are not included in the appendix.

MARYLAND:

Provisions in this state include:

1. must have biennial vehicle emissions inspection;
2. if vehicle fails initial test, must be repaired within 30 days;
3. waivers are granted if $75 is spent on repairs;
4. waivers are granted if financial hardship can be shown;
5. maximum inspection fees are set by regulation.

MASSACHUSETTS:

Massachusetts does have legislation regarding motor vehicle emissions restrictions and does have an inspection procedure in place. Unfortunately, at the time of writing of this paper the relevant legislation was unavailable to the author. The legislation for this state therefor, will not be reviewed and is not included in the appendix.

MICHIGAN:

Provisions in this state include:

1. must have vehicle inspected within six months prior to registration;
2. applies to populated areas only;
3. if vehicle fails its initial inspection it is entitled to one free reinspection within 90 days;
4. a waiver is granted if the vehicle has a tune up and undergoes $50 worth of repairs;
5. provisions of the legislation apply only to vehicles manufactured after 1973;
6. the maximum fee which can be charged for an inspection is $10;
7. violations carry a penalty of up to $500 or 30 days in jail.

MINNESOTA:

Provisions in this state include:

1. must have vehicle inspected within 90 days prior to registration;
2. applies to all vehicles manufactured in or after 1976;
3. applies to populated areas only;
4. private businesses can be licensed to perform inspections, but no repairs can be performed by them;
5. waivers may be granted if vehicles have a certain value of repairs performed (value depends on vehicle);
6. 30 days granted to have repairs performed;
7. inspection stations may not refer vehicle owners to particular garages;
8. the maximum fee for an inspection is $10.

MISSISSIPPI:

There appears to be no vehicle emissions legislation in this state.

MISSOURI:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. only applies to vehicles manufactured after 1971;
3. no provisions for waivers.

MONTANA:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within Hawaii's motor vehicle legislation and are not included in the appendix.

NEBRASKA:

Provisions in this state include:

1. visible emissions restrictions- diesel only- 20% opacity for ten seconds or longer is a violation;
2. restrictions on tampering with diesel smoke control equipment;
3. reasonable time to correct is given before fine is imposed.

NEVADA:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. only applies in populated areas;
3. exemption on transfers of registration between husband and wife or between lessor and lessee;
4. duty to maintain standards between inspections- if violate, given 10 days to rectify before prosecution.

NEW HAMPSHIRE:

Provisions in this state include:

1. visible emissions restrictions- diesel powered- no smoke over 20% opacity for 15 seconds;
2. no idling a motor vehicle for more than five minutes (subject to some exceptions);
3. no tampering with emission control equipment;
4. visible emissions restrictions- gas powered- no visible emissions permitted;
5. applies to vehicles manufactured in 1967 or later.

NEW JERSEY:

Provisions in this state include:

Diesel powered vehicles:
1. no idling for more than three minutes (subject to some exceptions);
2 visible emissions restrictions- no more than 12% opacity;

Other vehicles:
3. visible emissions restrictions- no visible emissions are permitted;
4. no operating vehicle on highways if it is in violation of emission standards in regulations;
5. car dealers must check new cars to ensure emissions equipment is working;
6. no idling for more than 3 minutes (subject to some exceptions).

NEW MEXICO:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. does not apply to vehicles manufactured prior to 1967;
3. waivers are granted if the vehicle undergoes $75 worth of repairs;
4. one free reinspection within 30 days is granted to vehicles that fail the initial test;
5. technical waivers can be granted if the vehicle presents technical difficulties in testing because of its design.

NEW YORK:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. duty to maintain vehicle's emission standards between tests;
3. visible emissions restriction- diesel powered only- no greater than 20% opacity over five seconds;
4. no idling of diesel powered vehicles for more than five minutes (subject to some exceptions).

NORTH CAROLINA:

Provisions in this state include:

1. visible emissions restriction- gas powered- no visible emissions for more than five seconds;
2. visible emissions restriction- diesel powered- no greater

than 20% opacity over five seconds;
3. if a person violates the above provisions they get 30 days to rectify before prosecution.

NORTH DAKOTA:

Provisions in this state include:

1. no unreasonable or excessive smoke from any internal combustion engine;
2. no tampering with pollution control devices.

OHIO:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. provisions for anti-tampering inspection only.

OKLAHOMA:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. provisions for anti-tampering or malfunction inspection only;
3. if vehicle fails the inspection, the owner is given 30 days to rectify before prosecution.

OREGON:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. provisions for anti-tampering or malfunction inspection only;
3. maximum inspection fee is set at $10.

PENNSYLVANIA:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. five day waivers are granted for the transfer of vehicles;
3. ten day waivers are granted to vehicles that were out of state at their assigned time.

RHODE ISLAND:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;

2. a prohibition on producing visible emissions.

These provisions are contained within Rhode Island's motor vehicle legislation and are not included in the appendix.

SOUTH CAROLINA:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within South Carolina's motor vehicle legislation and are not included in the appendix.

SOUTH DAKOTA:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within South Dakota's motor vehicle legislation and are not included in the appendix.

TENNESSEE:

Tennessee has made provisions for a voluntary testing program. There appear to be no required vehicle emission standards, but the legislation instituting the voluntary program is included in the appendix.

TEXAS:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. provisions for anti-tampering or malfunction inspection only;
3. prohibition against selling a vehicle that has tampered with or malfunctioning emission control equipment.

UTAH:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within Utah's motor vehicle legislation and are not included in the appendix.

VERMONT:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within Vermont's motor vehicle legislation and are not included in the appendix.

VIRGINIA:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. waivers are granted if the vehicle undergoes a certain values worth of repairs (the value depending on the vehicle);
3. a waiver is valid for two years;
4. the maximum fee for an inspection is $12.50.

WASHINGTON:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. waivers are granted if the vehicle undergoes $50 worth of repairs;
3. one free reinspection is granted to vehicles that fail the initial test;
4. only applies to vehicles in areas designated as problem areas.

WEST VIRGINIA:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within West Virginia's motor vehicle legislation and are not included in the appendix.

WISCONSIN:

Provisions in this state include:

1. must have vehicle inspected prior to registration;
2. provides for an anti-tampering and emission system inspection only;

3. only applies to vehicles manufactured less than 15 years ago;
4. a prohibition on tampering with emission equipment.

WYOMING:

Provisions in this state include:

1. a prohibition on tampering with emission equipment;
2. a prohibition on producing visible emissions.

These provisions are contained within Wyoming's motor vehicle legislation and are not included in the appendix.

POSSIBLE REFORMS:

FEDERAL vs. PROVINCIAL LEGISLATION

The United States has followed a system of legislation which parallels Canada's in many respects. The Federal Government in the U.S. has legislated emission requirements for new vehicles by setting manufacturing standards for many years. It has done this through the National Emissions Standards Act, 42 U.S.C., Secs. 1875f-1 to 1857f-7, inclusive (this legislation has not been included in the appendix due to its volume). Similarly, Canada's Federal government has regulated the manufacture of vehicles through the Motor Vehicle Safety Act, R.S.C. 1970 (1st. supp.) c.26, and regulations enacted thereunder (Motor Vehicle Safety Regulations, S.O.R./70-847).

The individual states, as can be seen above, have been left with the responsibility of enacting legislation to control emissions from vehicles after they have left the manufacturer. A similar situation exists in Canada, with one major difference though. Most of the states have enacted legislation to control the problem while few Canadian provinces have done the same. This may stem in large part from the U.S.'s National Ambient Air Quality Standards established pursuant to the Clean Air Act amendments of 1977 (standards can be found in G.S. 143-215.107(f)). This amendment required states to institute vehicle emission inspections in areas that did not meet the ambient air quality standards set by the Federal government. In response, many states set up inspection provisions in particularly problematic areas such as cities. Other states set up universal testing procedures. As a result, a majority of the states have emission control inspections of one form or another.

Canada does not have Federal provisions requiring vehicle emissions testing. It has been argued by some that such a general power exists in the Federal government though. To justify this stand they have turned to the Supreme Court case of R. v. Crown Zellerbach Canada Ltd, (1988) CELR (2d) 1 (S.C.C.). It might be argued that this problem has the singleness and indivisibility to remove it from provincial jurisdiction and make it a national problem in which the "P.O. & G.G." power could be used. It might also be argued that because the pollution produced by our vehicles crosses international borders, it is inherently a matter falling within Federal powers. For the opposite viewpoint we could turn to the strong dissent in the Zellerbach case and argue that the line is too difficult to draw as to where the province's exclusive jurisdiction prevails, and in cases such as these, it should be drawn in the provinces favour.

The matter is one which would inevitably constitute the topic for another entire paper, however, it exceeds the intent of this one. A sufficient conclusion for our purposes is that the province definitely has the power to institute inspections while the Federal government might have. In any case, this might be a moot point because an inspection program would probably be more effective and less costly if instituted by the province. This is because it could be established in conjunction with, and as a prerequisite to, the registration of a vehicle in the province. The program could include private inspection stations that were provincially monitored thereby further reducing costs to the government. The possibility of the federal government establishing a system of universal inspections is far more remote due to the costs and practical difficulties inherent in such a large proposal. The remainder of this paper is based upon that premise and outlines a proposal for draft legislation in Alberta.

PROPOSED LEGISLATION:

ALBERTA MOTOR VEHICLE EMISSIONS INSPECTION ACT

This portion of the paper is a suggestion for possible legislation in Alberta. Each section of the suggested statute will be discussed with reference to its utility and where applicable, the jurisdiction of the legislation upon which the section is based. (For a complete unedited version of the proposed statute, as well as the legislation referred to in this section, see attached appendix.)

This proposed statute is developed as separate legislation, however, it is recognised that incorporation into Alberta's Clean Air Act, R.S.A. 1980, c.C-12, is a very possible alternative and terms of reference were adopted from that statute wherever possible to enable such incorporation if required.

PART I

INTERPRETATION AND APPLICATION

1 In this Act,

(a) "air pollution control equipment" means any equipment or feature installed by the manufacturer or replaced with a device or system equivalent in design and function to the part that was originally installed on the motor vehicle which constitutes an operational element of the air pollution control system or mechanism of a motor vehicle;

This definition is based upon a definition contained in Florida's Clean Outdoor Air Law. It allows for possible advancements or changes in pollution control equipment because it is not specific in its reference to equipment such as "catalytic converter" unlike existing legislation in Quebec and Ontario. It also provides for situations in which the original manufacturer's equipment has been replaced, which Ontario's Environmental Protection Act does not.

(b) "approved exhaust emission analyzer" means an emission analyzer approved by the Minister which is designed to detect the levels of carbon monoxide, nitrogen oxides and hydrocarbons present in motor vehicle exhaust;

This definition is based upon one given in New Mexico's Motor Vehicle Inspection Rules. It has been amended in one significant manner though. New Mexico's legislation calls only for the monitoring of carbon monoxide and hydrocarbon levels. It has also been established that nitrogen oxides pose significant risks to the environment and, consequently, it is suggested that standards be set for these compounds as well. Quebec, for example, has already provided for such regulations in their environmental legislation (see "Quebec" in appendix).

(c) "compliance sticker" means a window sticker issued in accordance with section 16 of this Act and in accordance with the regulations;

This definition will be discussed later (see section 16, below)

(d) "Department" means the Department of the Environment;

This definition comes directly from Alberta's Clean Air Act to enable possible incorporation, as discussed above.

> *(e) "diesel engine" means all types of internal combustion engines in which air is compressed to a temperature sufficiently high to ignite fuel injected directly into the cylinder area;*

This definition can be found in Illinois' Mobile Sources Standards. It was used here because it appeared to be a well drafted definition.

> *(f) "diesel powered motor vehicle" means a motor vehicle which is self-propelled by a diesel engine and is designed primarily for transporting persons or property on a public street or highway;*

This definition is based loosely on a definition found within New Jersey's Regulations on Diesel-Powered Motor Vehicles. The definition is slightly more restrictive than for other "motor vehicles" in that it is limited to vehicles transporting on a public street or highway, and thus, vehicles not designed to be on the road are not subject to the legislation, even if they are subject to registration.

> *(g) "Director of Standards and Approvals" means the Director of the Division of Standards and Approvals of the Department;*

Once again, this definition coincides with that given in the Clean Air Act to facilitate incorporation.

> *(h) "emissions standard" means a requirement that limits the quantity, quality, rate, or concentration of exhaust emissions from a motor vehicle;*

This definition comes from Maryland's Motor Vehicle Emissions Act. Once again, it was chosen simply because of its clear, well drafted nature.

> *(i) "exemption sticker" means a window sticker issued to motor vehicles in accordance with section 13 of this Act and in accordance with the regulations;*

This definition will be discussed later (see section 13, below).

> *(j) "exhaust emissions" means substances emitted to the atmosphere from any opening downstream from the exhaust port of a motor vehicle engine;*

This was Kentucky's contribution to the proposed statute. Once again, the definition, found within the Kentucky Air Pollution Regulations was the clearest of those surveyed.

> *(k) "exhaust emissions test" means the sampling and measurement of certain components of the motor vehicle exhaust to determine whether the motor vehicle is in compliance with an emissions standard;*

This definition, also from Maryland's Motor Vehicle Emissions Act, was a logical choice considering the selection of Maryland's definition of "emissions standard".

> *(l) "facility" means a motor vehicle exhaust emissions testing and inspection facility established, operated, and licensed in accordance with this Act and the regulations;*

The definition of "facility" was designed based on the general structure of this statute.

> *(m) "gross vehicle weight" means the manufacturer's gross weight rating;*

This was taken from Ontario's Motor Vehicles Regulation.

> *(n) "inspection" means checking and testing a motor vehicle for compliance with emissions standards and other requirements established under this Act and the regulations;*

This definition is loosely based on one found within Michigan's Motor Vehicle Emissions Inspection Act and an important aspect to notice is that an "inspection" includes both an emissions test, and inspecting the vehicle for other infractions such as tampering.

> *(o) "inspector" means any person meeting the requirements of such inspectors and licensed by the Minister under this Act and the regulations to perform inspections;*

(Self explanatory)

> *(p) "interim sticker" means a window sticker issued in accordance with section 17 of this Act and in accordance with the regulations;*

This definition will be discussed later (see section 17, below).

> *(q) "leaded gasoline" means gasoline that is not unleaded gasoline;*

See "unleaded gasoline", below.

(r) "low emissions tune up" means the performance of the following procedures on a motor vehicle:

(i) inspection of the choke and its cleaning, repairing or replacing as required;

(ii) adjustment of the idle speed and air-fuel mixture according to manufacturer's specifications;

(iii) adjustment of the ignition dwell or gap and ignition timing according to manufacturer's specifications;

(iv) inspection of the positive crankcase ventilation valve and vacuum hoses and their repair and replacement as required;

(v) inspection of the spark plugs and spark plug wires and their repair and replacement as may be required;

(vi) inspection of the air filter and fuel filter and their replacement as required; and

(vii) inspection of the distributor and distributor cap and their replacement as required.

Many of the U.S. states require a low emissions tune up to be performed on vehicles which do not meet emissions standards. Many of these states, though, provide a minimal definition of a "tune up". This could later provide problems for both the courts and for motorists when trying to follow the law. This definition, based on one found in Virginia's Motor Vehicle Emissions Control Law, is clearer and more specific than those found in a majority of the states and should avoid difficulties.

(s) "Minister" means the Minister of the Environment.

Taken from Alberta's Clean Air Act.

(t) "model year" means the model year designated by the manufacturer but, where the manufacturer does not make such a designation, means the calender year in which the manufacture of a motor vehicle or motor is completed;

This definition is taken from Ontario's Motor Vehicles Regulation and incorporates an important aspect in recognising that some vehicles, sometimes referred to as "kit cars" would fall outside of a less precise definition.

(u) "motor" means an internal combustion engine;

(v) "motorcycle" means a motor vehicle having a seat or saddle for the use of the driver and designated to travel on not more than three wheels in contact with the ground and includes a bicycle with a motor attached and a motor scooter;

(w) "motor vehicle" means any vehicle which:

(i) is subject to registration in Alberta by the Department of Motor Vehicles;

(ii) is designed for the transport of persons or property;

(iii) is less than twenty-one years old, measured from the model year of such motor vehicle;

(iv) is powered by a motor; and

(v) has a gross vehicle weight of 4550 kilograms or less,

but does not include any;

(vi) motorcycle; or

(vii) vehicle which, at the time of its manufacture, was not designed to meet the emissions standards set by the federal government.

This definition incorporates aspects of legislation from a number of jurisdictions. The same basic structure was used by Virginia in their Motor Vehicle Emissions Control Law. Ontario also used similar provisions in their Environmental Protection Act and several other states use definitions which are similar. The purpose of this section is to limit the scope of the legislation to avoid politically dangerous situations, such as the inclusion of farm tractors here in Alberta, or practically unworkable situations such as the inclusion of special emission standards developed for a small number of motorcycles or special testing centres being required for large trucks.

> *(x) "multi-fuelled motor vehicle" means any vehicle originally manufactured, designed, or converted from its original manufacturer's specification to utilize more than one fuel type, one of which is gasoline;*

This definition is included in Ohio's Air Pollution Rules and seems especially appropriate to include in Alberta's legislation considering the number of multi-fuelled vehicles that exist in this province.

> *(y) "new motor vehicle" means a motor vehicle whose model year is the present calender year or the present calender year plus one;*

This definition is based on a similar definition contained in Indiana's Air Regulations. The most important aspect of this definition is that it recognises that there are some new vehicles on the road which are next years model. Many U.S. statutes fail to recognise this.

> *(z) "new vehicle sticker" means a window sticker issued in accordance with section 15 of this Act and in accordance with the regulations;*

This will be discussed later (see section 15, below).

> *(aa) "opacity" means the degree to which a exhaust emissions will block the passage of a beam of light expressed as a percentage;*

This definition is based upon a similar definition used in Nebraska's Motor and Diesel-Powered Motor Vehicle Act. It allows for a precise measurement of any "smoke" produced by a vehicle, yet is also broad enough to allow for various measurement techniques depending, as is discussed later, upon the Ministers discretion.

> *(bb) "person" means an individual, corporation, association, partnership, sole proprietorship, or other legal entity; the province of Alberta, a city, village, township, or county within Alberta and an agency, department, or instrumentality of any of these; or an employee, officer, or agent of any of the above;*

As can be seen from this definition, provincial and local governments will also be bound by this legislation. This should help to keep exhaust emission standards set by the Minister from being set at a level which is difficult to comply with. The definition is based upon one found within Michigan's Motor Vehicle Inspection Act. It also takes into account other legal entities, but avoids constitutional and practical difficulties by not including the federal government. This aspect differs from Michigan's statute which does include the federal government and its agencies and departments.

> *(cc) "registration renewal deadline" means the date that an unexpired motor vehicle registration will expire;*

(Self explanatory).

> *(dd) "smoke" means the solid or liquid matter, except water, discharged from a motor vehicle engine which obscures the transmission of light;*

This definition, taken from Nebraska's Motor and Diesel-Powered Motor Vehicle Act, includes a significant exception for vaporised water, an aspect which is noticeably absent from legislation in many southern states (probably because of the warmer weather conditions). It is probably a valuable addition to Alberta's statute due to our cold climate.

> *(ee) "smokemeter" means a full flow light-extinction smokemeter of a type approved by the Minister;*

This definition is also based upon Nebraska's statute and is included because it provides some guidance to the Minister as to what type of measurement instrument should be used to measure smoke. This type of smokemeter is used in most of the states and is small enough to be carried and used by police officers, yet the definition is broad enough that it may include more advanced, complex, but larger machines.

> *(ff) "smoke control system" means a system consisting of one or more devices and adjustments designed to control the discharge of smoke from diesel powered motor vehicles;*

This definition, like the definition for "air pollution control equipment", is designed to account for advances in the industry and avoids naming specific types of equipment because different smoke control systems may be used in the future. Once again, this definition is based upon one used in Nebraska's statute.

> *(gg) "repair sticker" means a window sticker issued in accordance with section 14 of this Act and in accordance with the regulations;*

This will be discussed later (see section 14, below).

> *(hh) "tamper" means to remove or render inoperative, or cause to be removed or rendered inoperative, or to make less operative, an emission*

control device, or an element of an emission control device that is required by federal law to be installed on or in a motor vehicle;

This definition, borrowed from Michigan's Motor Vehicle Emissions Inspection Act, is a broad definition designed to close any loophole which may be available to a person trying to escape liability under section 9, below.

(ii) "unleaded gasoline" means gasoline that contains not more than 0.013 grams of lead per litre and not more than 0.0013 grams of phosphorus per litre;

This definition is taken directly from Ontario's Motor Vehicles Regulation. It is only used as an example and the numbers may be changed to reflect Alberta's fuel additive requirements.

(jj) "waiver" means a legal instrument that relinquishes this province's authority to deny the registration of a motor vehicle pursuant to this Act and Regulations enacted hereunder.

This definition will be discussed in greater detail under section 18, but, it is obviously designed as a form of exemption that is more specific than the exemptions covered under the definition of "motor vehicle". Michigan has a similar definition in their Motor Vehicle Emissions Inspection Act.

2 This Act does not apply to emergency vehicles operated by federal, provincial, or local government authorities.

The purpose of this section, obviously, is to exclude emergency vehicles. The reason for this may also be obvious in that in an emergency, a person should not have to worry about whether the vehicle meets emission standards. It also has a less obvious function though. Emission control equipment has a tendency to reduce the power available from a motor vehicle engine. Emergency vehicles may require that extra power in some situations and should not be limited by pollution control equipment.

PART II

DIESEL POWERED MOTOR VEHICLES

3 No person shall operate or cause or permit the operation of a diesel powered motor vehicle which emits smoke in excess of 20 percent opacity, averaged over a 15-second period.

These requirements are somewhat lower than those for gasoline engines found in section 10, below. This is because all diesel engines have a tendency to produce at least some visible smoke. There should still be some control over the amount of this smoke that diesel vehicles are permitted to produce though. Through this section of the Act, police officers could measure the amount of smoke produced (with a "smokemeter", described above) and have a practical, but precise guide as to whether a violation is occurring. The fine under this section ranges from $50 to $100 (see section 30, below).

> *4 No person shall idle a diesel powered motor vehicle or cause or permit the idling of a diesel powered motor vehicle for more than five consecutive minutes when the motor vehicle is not in motion, except;*

When a motor vehicle is idling it is, perhaps, in its least efficient mode of operating. It uses a relatively large amount of fuel and produces high levels of exhaust emissions. Several states have recognised this and drafted similar legislation including New Hampshire, New York and District of Columbia.

> *(a) when the motor vehicle is forced to remain motionless because of traffic conditions over which the operator has no control,*

This exception is self explanatory.

> *(b) when the motor vehicle is operating in an area where temperatures below -23 degrees celsius are predicted,*

It must be recognised that diesel engines do not operate very well in colder conditions and thus, leaving the engine of a diesel vehicle running in these conditions serves a useful purpose. This exemption also exists in the New Hampshire and New Jersey legislation, though the temperature values may differ.

> *(c) when a diesel engine is providing;*
>
> *(i) power takeoff for refrigeration, lift gate pumps or other auxiliary uses,*
>
> *(ii) heat or air conditioning necessary for passenger comfort in those vehicles intended for commercial passenger transportation,*

Each of these exemptions recognise the special needs of the transportation industry. All of the states having diesel idling restrictions recognise the first exemption while only New York and

New Hampshire recognise the second. Considering the climate of Alberta though, it is probably a reasonable exemption.

> *(d) when the diesel engine is undergoing maintenance if necessary for such maintenance, but only when operated by a qualified mechanic,*
>
> *(e) when the motor vehicle is being operated under emergency conditions,*

These are all limited, but useful exemptions that most jurisdictions include. (e) is also required because the exemption in section 2 above does not necessarily include regular vehicles, for example buses, that are used in emergency situations.

> *(f) when the motor vehicle is engaged in the process of connection, detachment or exchange of trailers,*
>
> *(g) when the motor vehicle is manufactured with a sleeper berth which is being used, in a non-residentially zoned area, by the vehicle's operator for sleeping or resting, or*

Once again, these are practical exemptions included for the benefit of the transportation industry to reduce the disruption this legislation might produce.

> *(h) when the motor vehicle is being used for other purposes which the Minister, by regulation, may allow.*

This provision, of course, leaves the Minister the option of excluding other vehicles for reasons that may not have been considered here and is, in effect, a safety net. Violation of this section results in a fine ranging from $50 to $100 (see section 30, below).

> *5 No person owning or operating a diesel powered motor vehicle shall alter or remove any smoke control system or any portion thereof which may limit or reduce the ability of that system to control the motor vehicle's smoke, except;*
>
> *(a) when the diesel engine is undergoing maintenance if necessary for that maintenance, but only when performed by a qualified mechanic, or*
>
> *(b) in such other circumstances as the Minister, by regulation, may allow.*

This section, once again, is self explanatory. It also includes a safety net provision, for circumstances that were not predicted at the time the statute was drafted. Violation of this section results in a fine ranging from $200 to $20 000 (see section 31, below).

PART III

GASOLINE AND MULTI-FUELLED MOTOR VEHICLES

6 This Part applies to

(a) gasoline fuelled motor vehicles; and

(b) multi-fuelled motor vehicles;

This section includes multi-fuelled motor vehicles for two reasons. Firstly, the vehicle is designed to use gasoline as well as another fuel, and therefor, should be subject to the same restrictions as other gasoline vehicles. Secondly, a vehicle designed to run on two fuels burns the alternative fuel, propane for example, less efficiently than 100% propane vehicles because the engine tune up specifications are adjusted to compromise between the optimal settings for gasoline and the optimal settings for propane. The result is a vehicle which produces more emissions than a 100% propane fuelled vehicle.

but does not apply to

(c) diesel fuelled motor vehicles;

(d) alternative fuelled motor vehicles using one hundred percent propane, butane, alcohol, or natural gas;

(e) electrically powered vehicles; or

(f) other classes of vehicles that the Minister, by regulation, may exempt because their power source does not produce significant air pollution.

Each of these exclusions are included either because they are included in other sections of the statute or because they produce lower levels of emissions. The result of these exceptions might even be to induce individuals to convert to cleaner burning fuels because they would avoid the requirements under this section of the legislation.

7 (1) No person shall use leaded gasoline as a fuel to operate a motor vehicle manufactured with air

> *pollution control equipment where that equipment would be impaired in its functioning by the use of leaded gasoline.*
>
> *(2) No person shall operate or cause or permit the operation of a motor vehicle with air pollution control equipment of a design which is normally impaired in its functioning by the use of leaded gasoline, if*
>
> > *(a) leaded gasoline has been used as a fuel in the motor vehicle, and*
> >
> > *(b) the air pollution control equipment has not been repaired or replaced following such use.*

Section 7 was included despite the elimination of leaded gas in January of 1991 because there is likely to still be a stockpile of some leaded fuel that will be used after the January deadline. One possible holder of this stockpile would be farmers for example. After a period of time section 7(1) could be eliminated, but section 7(2) would still be a useful provision because vehicles which had previously run on leaded gasoline and destroyed their emission control system might still remain in circulation. This is especially true of vehicles that were brought from other jurisdictions and then registered in Alberta. It might be argued that section 8 could cover such situations, and indeed , it was drafted in such a manner that it could. A court, though, might be more likely to impose a stronger sentence if an individual was charged under section 7 because it shows more disregard for the law. Violation of section 7 results in a fine ranging from $200 to $20 000 (see section 31, below).

> *8 In respect of a motor or motor vehicle with air pollution control equipment, the equipment*
>
> > *(a) shall be maintained and kept in such a state of repair that it is capable of performing the function for which it was intended; and*
> >
> > *(b) shall be kept installed on, attached to or incorporated in the motor or motor vehicle in such a manner that, when the motor or motor vehicle is operating, the equipment functions in the manner in which it was intended to function.*

This is the mildest of the "good repair" sections and is designed for those offenses arising without clear intention or malice, but by simple lack of concern for example. Violation of section 8(b) results in a fine ranging, in the courts discretion, from $200 to $20 000 (see section 31, below).

> *9 (1) No person shall rent, lease, offer for sale, or in any manner transfer ownership of a motor vehicle with knowledge that the vehicle has been subject to tampering.*
>
> *(2) No person shall cause, suffer, allow or permit the removal, dismantling, disconnection, disabling, or disrepair of any air pollution control equipment.*
>
> *(3) No person shall operate a motor vehicle within the province of Alberta with knowledge that the vehicle has been subject to tampering.*

Violation of this section carries the most severe penalties ranging from a $500 - $20 000 fine to six months in jail, or both (see section 32, below). Because of the severe penalties, intention or knowledge is a required part of the violation. This section is, of course, reserved for the most flagrant of violators and will probably be rarely used. It is based upon a similar provision contained within Indiana's Air Regulations, however, the penalty imposed in Indiana is a maximum of $2 500 with no minimum stated. I believe, though, that a higher ceiling on fines would serve as a more effective deterrent even if the maximum was never imposed and even if, as was mentioned before, a charge under this section was rarely made.

> *10 No person shall operate or cause or permit the operation of a motor vehicle which discharges smoke, whether emitted from the crankcase, the exhaust system, or any part of the power system, for more than:*
>
> *(a) ten continuous seconds; or*
>
> *(b) fifteen seconds in any five-minute period.*

This section was drafted with the purpose of allowing police officers to quickly determine if a charge was warranted in any particular situation. There would be a specified penalty of either $50 or $100 dollars (see section 30, below). This penalty is severe enough to induce people to repair their vehicles, yet not so severe as to make people feel it is unfair.

> *11 No person shall idle a motor vehicle which is classified as a bus or truck, or cause or permit the idling of a motor vehicle classified as a bus or truck, for more than five consecutive minutes when the motor vehicle is not in motion, except*

> *(a) when the motor vehicle is forced to remain motionless because of traffic conditions over which the operator has no control,*
>
> *(b) when the motor vehicle is operating in an area where temperatures below -23 degrees celsius are predicted,*
>
> *(c) when the engine is providing;*
>
> > *(i) power takeoff for refrigeration, lift gate pumps or other auxiliary uses,*
> >
> > *(ii) heat or air conditioning necessary for passenger comfort in those vehicles intended for commercial passenger transportation,*
>
> *(d) when the engine is undergoing maintenance if necessary for such maintenance, but only when operated by a qualified mechanic,*
>
> *(e) when the motor vehicle is being operated under emergency conditions,*
>
> *(f) when the motor vehicle is engaged in the process of connection, detachment or exchange of trailers,*
>
> *(g) when the motor vehicle is manufactured with a sleeper berth which is being used, in a non-residentially zoned area, by the vehicle's operator for sleeping or resting, or*
>
> *(h) when the motor vehicle is being used for other purposes which the Minister, by regulation, may allow.*

This section is almost identical to section 4 above and consequently, the same comments made with respect to section 4 apply here as well. A fine of $50 to $100 is imposed for violations of this section (see section 30, below).

> *12 (1) Each motor vehicle registered in Alberta must be inspected annually for exhaust emissions unless exempted by this Act or the regulations.*

Annual inspections were chosen because they were the easiest to regulate in conjunction with annual vehicle registrations. Most states also utilise this system, though a few, Virginia for example, use a biennial system. It is clear, however, that the more often a vehicle is checked, the more often it will be in peak running condition. This repeated checking must be tempered with practicality though, and as a result, a one year gap between inspections appears to be the best alternative.

> *(2) Inspections must take place at a facility within 90 days prior to the registration renewal deadline for the vehicle.*

This provision ensures that an individual will have a vehicle that will meet, or at least come close, to specifications when it is registered. It also allows for a reasonable structure to the administration of the legislation as will be seen.

> *(3) The registration on a motor vehicle may not be issued or renewed unless the vehicle possesses a valid*
>
> *(a) compliance sticker,*
>
> *(b) new vehicle sticker,*
>
> *(c) interim sticker,*
>
> *(d) repair sticker, or*
>
> *(e) exemption sticker,*
>
> *in accordance with this Act and the regulations.*
>
> *(4) All motor vehicles shall display one of the following types of valid stickers:*
>
> *(a) exemption sticker;*
>
> *(b) repair sticker;*
>
> *(c) new vehicle sticker;*
>
> *(d) compliance sticker;*
>
> *(e) interim sticker.*
>
> *(5) The stickers referred to in subsection 4 shall be affixed to the lower left-hand corner of the motor vehicle's front window.*

Each of these stickers will be discussed individually below. They each represent a different situation and cover the range of different circumstances that may arise. The use of stickers, an idea borrowed from the way Indiana administers its legislation, is useful because it readily identifies those vehicles which are in compliance or in violation to the people who are to be most responsible for enforcement - police officers. With stickers, the police officer would simply check the colour or date of a sticker and be able to determine whether the vehicle was in violation.

> *13 (1) The following motor vehicles, upon inspection, are entitled to an exemption sticker:*
>
> > *(a) a motor vehicle of a model year older than 11 years or powered by an engine of a model year older than 11 years;*

Any age could have been chosen, but after a review of existing legislation, it was decided that 11 years seemed reasonable. There seems to be a general consensus that between 10 and 15 years after a car is manufactured, it becomes very difficult and prohibitively expensive to maintain its running condition, especially when one considers the economic status of many individuals who own vehicles of this era (university students for example). The availability of parts for older vehicles must also be considered when designating this cut-off point.

> > *(b) any motor vehicle exempted from this Part or not subject to this Part;*

(Diesel or alternatively fuelled vehicles for example).

> > *(c) a motor vehicle of a class exempted by the Minister, by regulation, because the vehicles present prohibitive inspection problems or are inappropriate for inspection.*

Once again, a safety net provision was included to provide for unexpected situations where a revision of the statute would be impractical.

> *(2) A valid exemption sticker remains valid*
>
> > *(a) for the lifetime of the motor vehicle,*
> >
> > *(b) until the vehicle possessing the sticker is no longer exempted from this Part or becomes subject to this Part, or*
> >
> > *(c) until the Minister, by regulation, rescinds the exemption made under subsection 1(b) of a class of motor vehicles including the vehicle possessing an exemption sticker,*
>
> *whichever is the first to occur.*

This subsection appears to be self explanatory.

14 (1) A repair sticker shall be issued to motor vehicles failing an initial inspection.

(2) Repair stickers shall be displayed along with an existing sticker and shall validate the existing sticker for one month beyond the vehicle's registration renewal deadline.

This gives the owner the opportunity to have the vehicle repaired in the extra month provided. The sticker also allows him or her to register the vehicle so that they will not miss their reregistration deadline, but as the next section illustrates, they must still meet the requirements of the legislation within that one month period or their registration is revoked. Obviously, this as well as other aspects of the proposed legislation will require revision of the motor vehicle registration legislation and possibly other statutes as well, but the discussion of those amendments are beyond the scope of this paper and will be left up to the readers imagination.

(3) Upon expiry of the repair sticker, a motor vehicle's registration will immediately expire, unless

(a) a valid interim sticker has been issued for the vehicle in accordance with section 17(1)(a);

Interim stickers will be discussed below, but for the purposes of this section, an interim sticker might be issued to a vehicle that could not be repaired in time due to a shortage of parts etc. In effect, the interim sticker is a further extension of time but is only granted upon application.

(b) a valid compliance sticker or exemption sticker has been issued for the vehicle.

Ie. the vehicle passes a second inspection after being repaired or is granted a waiver (see section 16, below).

15 (1) A new vehicle sticker shall be issued by the Department of Motor Vehicles upon satisfaction that the new vehicle has not been registered before.

(2) A new motor vehicle sticker shall be displayed on a new motor vehicle within thirty days of initial registration.

(3) A new motor vehicle sticker shall be valid from its date of issue and shall expire 90 days prior to the vehicle's next subsequent registration renewal deadline.

This section allows the initial registrar of a vehicle to avoid the cost of an inspection with the assumption that the car was built to meet the federal standards and that any inspection of a new vehicle would be a moot point.

> *(4) Notwithstanding subsection 3, a new vehicle sticker shall remain valid for the purposes of section 12(4) until the vehicle's next subsequent registration renewal deadline.*

The point of this subsection is to firstly, ensure that a person is required to get a new sticker to reregister the vehicle and secondly, to ensure that they are not found liable under section 12(4) during the 90 day period prior to reregistration for not having a valid sticker.

> *16 (1) A compliance sticker shall be issued to motor vehicles that*
>
> > *(a) pass the inspection, or*
> >
> > *(b) are granted a waiver.*

For more information on waivers, see section 18, below.

> *(2) A compliance sticker shall be valid from its date of issue and shall expire 90 days prior to the vehicle's next subsequent registration renewal deadline.*

As was mentioned above, because a valid sticker is required to reregister a vehicle, the old stickers must expire prior to a persons application or there would be no reason to refuse registration because the old sticker would still be valid at the time of application. This, in effect, forces people to get a new sticker for each years reregistration because the old one has expired.

> *(3) Notwithstanding subsection 2, a compliance sticker shall remain valid for the purposes of section 12(4) until the vehicle's next subsequent registration renewal deadline.*

The discussion made under section 15(4) above is also applicable here.

> *17 (1) Upon application, an interim sticker may be issued by the Department to a motor vehicle that*
>
> > *(a) fails an initial inspection and is unable to complete repairs within the time permitted by a repair sticker due to unavailability of required parts or other circumstances which are beyond the reasonable control of the owner or lessee;*

This was discussed under section 14(3)(a) above.

> *(b) will be absent from the province for 90 days preceding the vehicle's registration renewal deadline thereby precluding an inspection.*

This provision was included for those individuals who might be travelling outside of Alberta for a significant period of time just prior to their reregistration date. It allows them to apply in advance to the Department for an interim sticker for when they return to this province. As will be seen below, such a sticker will only be granted upon reasonable evidence that you will be outside of Alberta (hotel reservations might suffice for example).

> *(2) Interim stickers may be issued only to persons who present reasonable evidence to the department of circumstances warranting such issuance.*
>
> *(3) For the purposes of subsection 1(a), an interim sticker shall only be issued within 10 days of the expiry of the repair sticker.*

This time period allows for a more reasonable determination of whether such a sticker will be required.

> *(4) An interim sticker shall be valid from its date of issue and shall expire no later than one month after being issued.*
>
> *(5) Upon expiry of the interim sticker, a motor vehicle's registration will immediately expire, unless*
>
> *(a) a new valid interim sticker has been issued for the vehicle in accordance with this section;*
>
> *(b) a valid compliance sticker or exemption sticker has been issued for the vehicle.*

These subsections are self explanatory.

> *(6) successive interim stickers may be granted to a person at the same time and, in the case of successive stickers, the date of issue of each sticker shall be the date specified by the Department and printed on that sticker.*

This will allow people, especially those travelling outside of Alberta, to apply once for all the required stickers instead of being limited to a one month extension.

> *18 (1) A waiver may be issued to a person if*

(a) their motor vehicle fails an initial inspection;

(b) their motor vehicle undergoes a low emissions tune up within one month of the initial inspection, and,

The requirement of a tune up is one found in almost all U.S. jurisdictions having similar legislation (see Maryland, Virginia, Alabama, Arizona, and Michigan for example). This provides a guide to both vehicle owners and to mechanics as to what repairs will affect the vehicles performance in the emissions test.

(i) the motor vehicle undergoes repairs costing $75 or more within one month of the initial inspection, or

The provision for repairs is one which is found almost uniformly across all U.S. jurisdictions. The dollar figure is only a suggestion and it may even be wise to prescribe different dollar values depending on the age of the vehicle. The intent of this section is to ensure that those vehicles that do not pass the emissions test are at least being improved to some extent.

(ii) the person presents reasonable evidence that the estimate of minimum repairs is higher than $75; and

This provision is for those poor individuals whose only remedy for their vehicle's substandard emissions test is to replace the vehicles engine or something else quite drastic and expensive.

(c) the motor vehicle fails its reinspection.

If the $75 dollars worth of repairs works, than a waiver is not required because the vehicle passed its second inspection.

(2) For the purposes of subsection 1, the cost of repairs and the estimate of repairs do not include

(a) costs covered by any warranty, insurance policy, or prepaid maintenance agreement for the benefit of the motor vehicle owner or lessee;

It is obvious that an individual who does not suffer the expense of repairs is not in need of protection from the expense of meeting the emissions standards.

(b) costs necessary to repair or replace any part of the air pollution control equipment

> *which has been tampered with in violation of this Act.*

This is another obvious exception. The guilty individual should not be protected from the expense of repairing the damage.

> *(3) Upon application, a waiver may be issued to a person by the Department if there is a clear indication that the cost of required repairs to the motor vehicle would place a substantial financial burden on the person.*

$75 dollars may not be an extremely high amount of money, but as was mentioned before, this number could be altered and a subsection like 3 would protect those who could show, upon application to the department, that they were substantially prejudiced by the requirements.

> *(4) Subsection 3 does not apply to a person who has tampered with any part of the air pollution control equipment in violation of this Act.*

The same comments made with respect to subsection 2 apply here also.

> *(5) A person granted a waiver under this section shall be issued a compliance sticker.*
>
> *(6) A waiver shall be valid from its date of issue and shall expire 90 days prior to the vehicle's next subsequent registration renewal deadline.*

These provisions are self explanatory.

> *19 Every motor vehicle which fails an initial inspection is entitled to one reinspection without charge within one month of the initial inspection.*

This provision is one which is found in a number of U.S. jurisdictions including Connecticut, Florida, Arizona, Michigan, New Mexico and Washington. The idea is to reduce the expense to those who have to have repairs done because they failed the initial test.

> *20 The inspection of a motor vehicle and the issuance of a sticker does not constitute a warranty of the mechanical condition of the motor vehicle.*

This section, also found within Florida's Clean Outdoor Air Law, obviously eliminates any liability of the government to owners or purchasers for certifying the vehicle. Just because the vehicle passes the emissions test does not mean that the vehicle's engine is not about to wear out, for example. It may not be absolutely necessary to include such a provision- indeed, many jurisdictions do not- but it may be a prudent move to do so to avoid any problems in the future.

> *21 (1) The cost of any inspection required to transfer ownership of a motor vehicle shall be borne by the vendor or seller of the motor vehicle.*
>
> *(2) If a person enters into a contract for the sale and purchase of a motor vehicle, the vendor or seller is deemed to warrant to the purchaser that the vehicle will pass an inspection unless the contract expressly provides that there is no such warranty.*

These sections are based upon similar provisions within Arizona's Air Pollution Laws. The intent is to protect the purchaser from a large, unexpected expense when they attempt to transfer registration.

> *22 (1) The Minister may make regulations*
>
> *(a) prescribing additional circumstances in which motor vehicles shall be exempt or classes of motor vehicles which shall be exempt from sections 4, 5, 6, 11 and 13;*
>
> *(b) prescribing the design and matters incidental to the application and issuance of*
>
> *(i) new vehicle stickers,*
>
> *(ii) compliance stickers,*
>
> *(iii) exemption stickers,*
>
> *(iv) interim stickers,*
>
> *(v) repair stickers, and*
>
> *(vi) waivers.*

These matters are obviously aspects which are more practically left out of the statute because of a statute's rigidity.

> *(2) The Minister, with the aid of the Director of Standards and Approvals, may make regulations*
>
> *(a) prescribing smokemeters and the method or type of method to be used for determining or measuring smoke;*

(b) prescribing approved exhaust emissions analyzers which

(i) provide a simple, automatic "pass/fail" reading, and

(ii) are tamper resistant;

These provisions are similar to California's. The idea embraced is to avoid any possible defrauding of customers at repair stations. If, for example, a mechanic at a garage is also a licensed inspector, the emissions analyzer would provide a simple pass or fail reading in addition to technical readouts and the mechanic could not misrepresent to the customer that their vehicle did not meet emission standards, when in fact, it did pass the test. These analyzers are easily obtainable because California has been using them for a number of years with success.

(c) prescribing the method or type of method to be used in determining exhaust emission levels;

(d) prescribing the procedure to be followed by an inspector when conducting an inspection or exhaust emissions test;

(e) prescribing

(i) the method of licensing inspectors,

(ii) required qualifications of inspectors, and

(iii) all matters incidental to the licensing of inspectors;

(f) prescribing

(i) the method of licensing private garages and businesses as facilities,

(ii) required qualifications of facilities,

(iii) all matters incidental to licensing facilities;

As is illustrated by the provisions under subsection f, it is envisioned that the inspection stations, or facilities, will be privately operated. There is the alternative of making them government operated in the same manner that Ontario chose to do, but the danger is that the expense and bureaucracy involved is far beyond what it would be to have privately run stations. The argument against private stations is that individuals may be subject to fraudulent practices. This can probably be avoided though, by rigid certification requirements and the use of automatic, tamper-resistant measurement equipment. Private stations would also be convenient for the public because their vehicles could be tested, repaired and retested in the space of an afternoon instead of having to run from location to location.

> *(g) prescribing the maximum fee which may be charged by a facility or inspector for an inspection, such fee not to exceed $20;*

Price controls on testing are found almost universally in U.S. jurisdictions. This keeps the price reasonable as is illustrated by the prices set by these jurisdictions which range from only $10 to $15. There is probably little danger from setting the price too low because mechanics will still want to inspect to be able to hook those vehicles that fail the inspection. After all, those vehicles that fail will need repairs done.

> *(h) prescribing the emissions standard which each motor vehicle must meet, such standards not to exceed the federal standards for that vehicle;*

The idea of not exceeding federal standards avoids a potential constitutional challenge. If standards were set higher than federal standards, it might be possible to argue that the province was encroaching upon the federal power to regulate trade and commerce under section 91(2) of The Constitution Act, 1867. It would be doing this by dictating to manufacturers outside of the province, and outside of the country, the specifications that their vehicles must meet. It would definitely be arguable that this was not merely of a "local and private nature" and thus, would be outside of the province's power. In any case, the political repercussions from outside, as well as inside the province would make this a highly undesirable alternative. The only U.S. state to use this alternative- California- has found that a number of problems have arisen as a result. Some vehicle manufacturers will not sell vehicles in that state because of the rigid standards and people cannot buy cars in other states and bring them into California when they Move, for example. The costs to Alberta would be even more significant though, because of our small population base and market size compared to California.

> *(i) prescribing fees, subject to subsection (g), that may be charged by the Department for any stickers, licences, or waivers granted or issued under this Act;*
>
> *(j) prescribing fines to which a person is liable upon breach of the regulations.*

PART IV

ENFORCEMENT

23 In any prosecution, proceeding or hearing under this Act or the regulations, the production of a certificate or report of an analyst of the Department or an inspector as to the analysis, description, ingredients, quality, quantity or temperature of any material, whether solid, liquid or gas, or any combination of them, is prima facie evidence of the facts stated therein and of the authority of the person making the certificate or report without any proof of appointment or signature.

This provision is taken from Ontario's Environmental Protection Act. It serves the obvious purpose of avoiding constant challenges of inspector's or analyst's authority, credentials, or testing procedure in every prosecution under this Act.

24 The Minister may designate in writing one or more officers or employees of the Department or other persons as provincial officers for the purposes of any section or Part of this Act or any regulation relating thereto.

25 (1) For the purpose of the administration of this Act and the regulations, a provincial officer may, from time to time and upon presentation of his designation, enter at any reasonable time any facility or motor vehicle and make or require to be made such surveys, examinations, investigations, tests and enquiries, including examinations of books, records, documents, machines and instruments, as he considers necessary, and may make, take and remove or may require to be made, taken or removed samples, copies or extracts.

(2) Where a justice of the peace is satisfied, upon an ex parte application by a provincial officer, that there is reasonable ground for believing that it is necessary to enter any facility, building, structure, machine or motor vehicle for the administration of this Act or the regulations, the justice of the peace may issue an order authorizing a provincial officer to enter therein or thereon and to make or require to be made such surveys, examinations, investigations, tests and enquiries, but every such entry, survey, examination, investigation, test, inquiry or other such action shall be made or taken between sunrise and sunset unless the justice of the peace authorizes the provincial officer, by the order, to so act at another time.

26 No person shall hinder or obstruct a provincial officer in the lawful performance of his duties or furnish a provincial officer with false information or refuse to furnish him with information required for the purposes of this Act and the regulations.

The purpose of sections 24, 25 and 26 is to set up a system for checking facilities and inspectors to ensure that they are following proper procedure as well as setting up a system of investigation if it appears that they are not.

27 (1) Any federal, provincial or local police officer, for the purpose of carrying out the provisions of this Act and the regulations, may require the driver of any motor vehicle to stop and may examine the motor vehicle and require the driver of the motor vehicle to submit the motor vehicle, together with its equipment and any trailer attached thereto, to such examinations and tests at such place or places and time or times as the police officer considers expedient.

(2) Every driver of a motor vehicle shall stop or submit the motor vehicle, together with its equipment and any trailer attached, to such examinations and tests as may be required by a police officer.

This section is self explanatory.

PART V

PENALTIES

28 If a person is found guilty of an offence under this Act or the regulations, the court in which proceedings in respect of the offence are taken may, in addition to any punishment it may impose,

(a) revoke any licence, authority, waiver, sticker, accreditation or motor vehicle registration granted under this Act or the regulations; or

(b) order that person to comply with the provisions of this Act or the regulations for the contravention of which he has been found guilty.

29 Every person who contravenes sections 3, 4, 10, or 11 of this Act is guilty of an offence and is liable

(a) in the case of an individual, to a fine of $50 for each offence; and

(b) in the case of a body corporate, to a fine of $100 for each offence.

Violation of these provisions are probably handled best by allowing police officers to hand out citations stating the specified penalty depending only on whether it is a corporation or individual.

> *30 Every person who contravenes sections 5, 7, or 8(b), of this Act is guilty of an offence and is liable*
>
> > *(a) in the case of an individual, to a fine of not less than $200 and not more than $500 for the first offence, and to a fine of not less than $500 and not more than $1 000 for any subsequent offence, or in any such case, to imprisonment for not more than one month or both such imprisonment and fine; and*
> >
> > *(b) in the case of a body corporate, to a fine of not less than $500 and not more than $10 000 for the first offence, and to a fine of not less than $2 000 and not more than $20 000 for any subsequent offence.*

These are obviously more serious offenses, but the defence of due diligence is still available to an offender under this section.

> *31 Every person who contravenes section 9 of this Act is guilty of an offence and is liable*
>
> > *(a) in the case of an individual, to a fine of not less than $500 and not more than $1 000 for the first offence, and to a fine of not less than $1 000 and not more than $5 000 for any subsequent offence, or in any such case, to imprisonment for not more than six months or both such imprisonment and fine; and*
> >
> > *(b) in the case of a body corporate, to a fine of not less than $1 000 and not more than $10 000 for the first offence, and to a fine of not less than $5 000 and not more than $20 000 for any subsequent offence.*

This is the most severe of the penalties, but as was discussed in section 9, it is probably the least likely to be utilised as well.

> *32 Every person who, without reasonable cause, contravenes section 12(4) of this Act is guilty of an offence and is liable*
>
> > *(a) in the case of an individual, to a fine of $300 for each offence; and*
> >
> > *(b) in the case of a body corporate, to a fine of $500 for each offence.*

Once again this is a specified penalty section. It makes the section easier to administer an makes results more predictable.

> *33 For the purposes of sections 30, 31, and 32, each day of continued violation is a separate offense.*

This provision is based on sections found in both Wisconson's Environmental Protection Law and Georgia's Vehicle Emissions Control Acts. It will expose individuals who are especially problematic to multiple charges and leaves some discretion to the Crown prosecutor as to the number of charges to lay. If this provision is included, the dollar values for each of these sections could be changed if it appears that exposure to fines might be too high.

> *34 Every person who, without reasonable cause, contravenes a provision of this Act or the regulations for which no penalty is provided is guilty of an offence and is liable*
>
> > *(a) in the case of a body corporate, a fine of not more than $20 000, and*
> >
> > *(b) in the case of an individual, a fine of not more than $1 000.*

This section can also be found in the Alberta Business Corporations Act, 1981, c.B-15, s. 244. It is a very effective tool in filling any "loopholes" that may exist in the legislation and leaves the discretion to the judge as to the severity of the penalty.

SOURCES

R.T. Franson & A.L. Lucas, eds, Canadian Environmental Law (Toronto and Vancouver: Butterworths, 1976).

The Bureau of National Affairs, Inc., Environment Reporter (Washington, D.C.: The Bureau of national Affairs, Inc., 1990).

APPENDIX

ALBERTA MOTOR VEHICLE EMISSIONS INSPECTION ACT

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of Alberta, enacts as follows:

PART I

INTERPRETATION AND APPLICATION

Definitions

1 In this Act,

(a) "air pollution control equipment" means any equipment or feature installed by the manufacturer or replaced with a device or system equivalent in design and function to the part that was originally installed on the motor vehicle which constitutes an operational element of the air pollution control system or mechanism of a motor vehicle;

(b) "approved exhaust emission analyzer" means an emission analyzer approved by the Minister which is designed to detect the levels of carbon monoxide, nitrogen oxides and hydrocarbons present in motor vehicle exhaust;

(c) "compliance sticker" means a window sticker issued in accordance with section 16 of this Act and in accordance with the regulations;

(d) "Department" means the Department of the Environment;

(e) "diesel engine" means all types of internal combustion engines in which air is compressed to a temperature sufficiently high to ignite fuel injected directly into the cylinder area;

(f) "diesel powered motor vehicle" means a motor vehicle which is self-propelled by a diesel engine and is designed primarily for transporting persons or property on a public street or highway;

(g) "Director of Standards and Approvals" means the Director of the Division of Standards and Approvals of the Department;

(h) "emissions standard" means a requirement that limits the quantity, quality, rate, or concentration of exhaust emissions from a motor vehicle;

(i) "exemption sticker" means a window sticker issued to motor vehicles in accordance with section 13 of this Act and in accordance with the regulations;

(j) "exhaust emissions" means substances emitted to the atmosphere from any opening downstream from the exhaust port of a motor vehicle engine;

(k) "exhaust emissions test" means the sampling and measurement of certain components of the motor vehicle exhaust to determine whether the motor vehicle is in compliance with an emissions standard;

(l) "facility" means a motor vehicle exhaust emissions testing and inspection facility established, operated, and licensed in accordance with this Act and the regulations;

(m) "gross vehicle weight" means the manufacturer's gross weight rating;

(n) "inspection" means checking and testing a motor vehicle for compliance with emissions standards and other requirements established under this Act and the regulations;

(o) "inspector" means any person meeting the requirements of such inspectors and licensed by the Minister under this Act and the regulations to perform inspections;

(p) "interim sticker" means a window sticker issued in accordance with section 17 of this Act and in accordance with the regulations;

(q) "leaded gasoline" means gasoline that is not unleaded gasoline;

(r) "low emissions tune up" means the performance of the following procedures on a motor vehicle:

(i) inspection of the choke and its cleaning, repairing or replacing as required;

(ii) adjustment of the idle speed and air-fuel mixture according to manufacturer's specifications;

(iii) adjustment of the ignition dwell or gap and ignition timing according to manufacturer's specifications;

(iv) inspection of the positive crankcase ventilation valve and vacuum hoses and their repair and replacement as required;

(v) inspection of the spark plugs and spark plug wires and their repair and replacement as may be required;

(vi) inspection of the air filter and fuel filter and their replacement as required; and

(vii) inspection of the distributor and distributor cap and their replacement as required.

(s) "Minister" means the Minister of the Environment.

(t) "model year" means the model year designated by the manufacturer but, where the manufacturer does not make such a designation, means the calender year in which the manufacture of a motor vehicle or motor is completed;

(u) "motor" means an internal combustion engine;

(v) "motorcycle" means a motor vehicle having a seat or saddle for the use of the driver and designated to travel on not more than three wheels in contact with the ground and includes a bicycle with a motor attached and a motor scooter;

(w) "motor vehicle" means any vehicle which:

(i) is subject to registration in Alberta by the Department of Motor Vehicles;

(ii) is designed for the transport of persons or property;

(iii) is less than twenty-one years old, measured from the model year of such motor vehicle;

(iv) is powered by a motor; and

(v) has a gross vehicle weight of 4550 kilograms or less, but does not include any;

(vi) motorcycle; or

(vii) vehicle which, at the time of its manufacture, was not designed to meet the emissions standards set by the federal government.

(x) "multi-fuelled motor vehicle" means any vehicle originally manufactured, designed, or converted from its original manufacturer's specification to utilize more than one fuel type, one of which is gasoline;

(y) "new motor vehicle" means a motor vehicle whose model year is the present calender year or the present calender year plus one;

(z) "new vehicle sticker" means a window sticker issued in accordance with section 15 of this Act and in accordance with the regulations;

(aa) "opacity" means the degree to which a exhaust emissions will block the passage of a beam of light expressed as a percentage;

(bb) "person" means an individual, corporation, association, partnership, sole proprietorship, or other legal entity; the province of Alberta, a city, village, township, or county within Alberta and an agency, department, or instrumentality of any of these; or an employee, officer, or agent of any of the above;

(cc) "registration renewal deadline" means the date that an unexpired motor vehicle registration will expire;

(dd) "smoke" means the solid or liquid matter, except water, discharged from a motor vehicle engine which obscures the transmission of light;

(ee) "smokemeter" means a full flow light-extinction smokemeter of a type approved by the Minister;

(ff) "smoke control system" means a system consisting of one or more devices and adjustments designed to control the discharge of smoke from diesel powered motor vehicles;

(gg) "repair sticker" means a window sticker issued in accordance with section 14 of this Act and in accordance with the regulations;

(hh) "tamper" means to remove or render inoperative, or cause to be removed or rendered inoperative, or to make less operative, an emission control device, or an element of an emission control device that is required by federal law to be installed on or in a motor vehicle;

(ii) "unleaded gasoline" means gasoline that contains not more than 0.013 grams of lead per litre and not more than 0.0013 grams of phosphorus per litre;

(jj) "waiver" means a legal instrument that relinquishes this province's authority to deny the registration of a motor vehicle pursuant to this Act and Regulations enacted hereunder.

Emergency Vehicles

2 This Act does not apply to emergency vehicles operated by federal, provincial, or local government authorities.

PART II

DIESEL POWERED MOTOR VEHICLES

No Smoke

3 No person shall operate or cause or permit the operation of a diesel powered motor vehicle which emits smoke in excess of 20 percent opacity, averaged over a 15-second period.

No Idling

4 No person shall idle a diesel powered motor vehicle or cause or permit the idling of a diesel powered motor vehicle for more than five consecutive minutes when the motor vehicle is not in motion, except;

(a) when the motor vehicle is forced to remain motionless because of traffic conditions over which the operator has no control,

(b) when the motor vehicle is operating in an area where temperatures below -23 degrees celsius are predicted,

(c) when a diesel engine is providing;

(i) power takeoff for refrigeration, lift gate pumps or other auxiliary uses,

(ii) heat or air conditioning necessary for passenger comfort in those vehicles intended for commercial passenger transportation,

(d) when the diesel engine is undergoing maintenance if necessary for such maintenance, but only when operated by a qualified mechanic,

(e) when the motor vehicle is being operated under emergency conditions,

(f) when the motor vehicle is engaged in the process of connection, detachment or exchange of trailers,

(g) when the motor vehicle is manufactured with a sleeper berth which is being used, in a non-residentially zoned area, by the vehicle's operator for sleeping or resting, or

(h) when the motor vehicle is being used for other purposes which the Minister, by regulation, may allow.

Removal of Smoke System

5 No person owning or operating a diesel powered motor vehicle shall alter or remove any smoke control system or any portion thereof which may limit or reduce the ability of that system to control the motor vehicle's smoke, except;

(a) when the diesel engine is undergoing maintenance if necessary for that maintenance, but only when performed by a qualified mechanic, or

(b) in such other circumstances as the Minister, by regulation, may allow.

PART III

GASOLINE AND MULTI-FUELLED MOTOR VEHICLES

Application of Part

6 This Part applies to

(a) gasoline fuelled motor vehicles; and

(b) multi-fuelled motor vehicles;

but does not apply to

(c) diesel fuelled motor vehicles;

(d) alternative fuelled motor vehicles using one hundred percent propane, butane, alcohol, or natural gas;

(e) electrically powered vehicles; or

(f) other classes of vehicles that the Minister, by regulation, may exempt because their power source does not produce significant air pollution.

Leaded Gasoline

7 (1) No person shall use leaded gasoline as a fuel to operate a motor vehicle manufactured with air pollution control equipment where that equipment would be impaired in its functioning by the use of leaded gasoline.

(2) No person shall operate or cause or permit the operation of a motor vehicle with air pollution control equipment of a design which is normally impaired in its functioning by the use of leaded gasoline if

(a) leaded gasoline has been used as a fuel in the motor vehicle, and

(b) the air pollution control equipment has not been repaired or replaced following such use.

Maintaining Equipment

8 In respect of a motor or motor vehicle with air pollution control equipment, the equipment

(a) shall be maintained and kept in such a state of repair that it is capable of performing the function for which it was intended; and

(b) shall be kept installed on, attached to or incorporated in the motor or motor vehicle in such a manner that, when the motor or motor vehicle is operating, the equipment functions in the manner in which it was intended to function.

No Tampering

9 (1) No person shall rent, lease, offer for sale, or

in any manner transfer ownership of a motor vehicle with knowledge that the vehicle has been subject to tampering.

(2) No person shall cause, suffer, allow or permit the removal, dismantling, disconnection, disabling, or disrepair of any air pollution control equipment.

(3) No person shall operate a motor vehicle within the province of Alberta with knowledge that the vehicle has been subject to tampering.

No Smoke

10 No person shall operate or cause or permit the operation of a motor vehicle which discharges smoke, whether emitted from the crankcase, the exhaust system, or any part of the power system, for more than:

(a) ten continuous seconds; or

(b) fifteen seconds in any five-minute period.

No Idling

11 No person shall idle a motor vehicle which is classified as a bus or truck, or cause or permit the idling of a motor vehicle classified as a bus or truck, for more than five consecutive minutes when the motor vehicle is not in motion, except

(a) when the motor vehicle is forced to remain motionless because of traffic conditions over which the operator has no control,

(b) when the motor vehicle is operating in an area where temperatures below -23 degrees celsius are predicted,

(c) when the engine is providing;

(i) power takeoff for refrigeration, lift gate pumps or other auxiliary uses,

(ii) heat or air conditioning necessary for passenger comfort in those vehicles intended for commercial passenger transportation,

(d) when the engine is undergoing maintenance if necessary for such maintenance, but only when operated by a qualified mechanic,

(e) when the motor vehicle is being operated under emergency conditions,

(f) when the motor vehicle is engaged in the process of connection, detachment or exchange of trailers,

(g) when the motor vehicle is manufactured with a sleeper berth which is being used, in a non-residentially zoned area, by the vehicle's operator for sleeping or resting, or

(h) when the motor vehicle is being used for other purposes which the Minister, by regulation, may allow.

Inspections and Registration

12 (1) Each motor vehicle registered in Alberta must be inspected annually for exhaust emissions unless exempted by this Act or the regulations.

(2) Inspections must take place at a facility within 90 days prior to the registration renewal deadline for the vehicle.

(3) The registration on a motor vehicle may not be issued or renewed unless the vehicle possesses a valid

(a) compliance sticker,

(b) new vehicle sticker,

(c) interim sticker,

(d) repair sticker, or

(e) exemption sticker,

in accordance with this Act and the regulations.

(4) All motor vehicles shall display one of the following types of valid stickers:

(a) exemption sticker;

(b) repair sticker;

(c) new vehicle sticker;

(d) compliance sticker;

(e) interim sticker.

(5) The stickers referred to in subsection 4 shall be affixed to the lower left-hand corner of the motor vehicle's front window.

Exemption Stickers

13 (1) The following motor vehicles, upon inspection, are entitled to an exemption sticker:

(a) a motor vehicle of a model year older than 11 years or powered by an engine of a model year older than 11 years; or

(b) any motor vehicle exempted from this Part or not subject to this Part;

(c) a motor vehicle of a class exempted by the Minister, by regulation, because the vehicles present prohibitive inspection problems or are inappropriate for inspection.

(2) A valid exemption sticker remains valid

(a) for the lifetime of the motor vehicle,

(b) until the vehicle possessing the sticker is no longer exempted from this Part or becomes subject to this Part, or

(c) until the Minister, by regulation, rescinds the exemption made under subsection 1(b) of a class of motor vehicles including the vehicle possessing an exemption sticker,

whichever is the first to occur.

Repair Stickers

14 (1) A repair sticker shall be issued to motor vehicles failing an initial inspection.

(2) Repair stickers shall be displayed along with an existing sticker and shall validate the existing sticker for one month beyond the vehicle's registration renewal deadline.

(3) Upon expiry of the repair sticker, a motor vehicle's registration will immediately expire, unless

(a) a valid interim sticker has been issued for the vehicle in accordance with section 17(1)(a);

(b) a valid compliance sticker or exemption sticker has been issued for the vehicle.

New Vehicle Stickers

15 (1) A new vehicle sticker shall be issued by the Department of Motor Vehicles upon satisfaction that the new vehicle has not been registered before.

(2) A new motor vehicle sticker shall be displayed on a new motor vehicle within thirty days of initial registration.

(3) A new motor vehicle sticker shall be valid from its date of issue and shall expire 90 days prior to the vehicle's next subsequent registration renewal deadline.

(4) Notwithstanding subsection 3, a new vehicle sticker shall remain valid for the purposes of section 12(4) until the vehicle's next subsequent registration renewal deadline.

Compliance Stickers

16 (1) A compliance sticker shall be issued to motor vehicles that

(a) pass the inspection, or

(b) are granted a waiver.

(2) A compliance sticker shall be valid from its date of issue and shall expire 90 days prior to the vehicle's next subsequent registration renewal deadline.

(3) Notwithstanding subsection 2, a compliance sticker shall remain valid for the purposes of section

(4) until the vehicle's next subsequent registration renewal deadline.

Interim Stickers

17 (1) Upon application, an interim sticker may be issued by the Department to a motor vehicle that

(a) fails an initial inspection and is unable to complete repairs within the time permitted by a repair sticker due to unavailability of required parts or other circumstances which are beyond the reasonable control of the owner or lessee;

(b) will be absent from the province for 90 days preceding the vehicle's registration renewal deadline thereby precluding an inspection.

(2) Interim stickers may be issued only to persons who present reasonable evidence to the department of

circumstances warranting such issuance.

(3) For the purposes of subsection 1(a), an interim sticker shall only be issued within 10 days of the expiry of the repair sticker.

(4) An interim sticker shall be valid from its date of issue and shall expire no later than one month after being issued.

(5) Upon expiry of the interim sticker, a motor vehicle's registration will immediately expire, unless

(a) a new valid interim sticker has been issued for the vehicle in accordance with this section;

(b) a valid compliance sticker or exemption sticker has been issued for the vehicle.

(6) Successive interim stickers may be granted to a person at the same time and, in the case of successive stickers, the date of issue of each sticker shall be the date specified by the Department and printed on that sticker.

Waivers

18 (1) A waiver may be issued to a person if

(a) their motor vehicle fails an initial inspection;

(b) their motor vehicle undergoes a low emissions tune up within one month of the initial inspection, and,

(i) the motor vehicle undergoes repairs costing $75 or more within one month of the initial inspection, or

(ii) the person presents reasonable evidence that the estimate of minimum repairs is higher than $75; and

(c) the motor vehicle fails its reinspection.

(2) For the purposes of subsection 1, the cost of repairs and the estimate of repairs do not include

(a) costs covered by any warranty, insurance policy, or prepaid maintenance agreement for the benefit of the motor vehicle owner or lessee;

(b) costs necessary to repair or replace any part of the air pollution control equipment which has been tampered with in violation of this Act.

(3) Upon application, a waiver may be issued to a person by the Department if there is a clear indication that the cost of required repairs to the motor vehicle would place a substantial financial burden on the person.

(4) Subsection 3 does not apply to a person who has tampered with any part of the air pollution control equipment in violation of this Act.

(5) A person granted a waiver under this section shall be issued a compliance sticker.

(6) A waiver shall be valid from its date of issue and shall expire 90 days prior to the vehicle's next subsequent registration renewal deadline.

One Free Reinspection

19 Every motor vehicle which fails an initial inspection is entitled to one reinspection without charge within one month of the initial inspection.

Sticker Not Warranty

20 The inspection of a motor vehicle and the issuance of a sticker does not constitute a warranty of the mechanical condition of the motor vehicle.

Sale of Vehicle

21 (1) The cost of any inspection required to transfer ownership of a motor vehicle shall be borne by the vendor or seller of the motor vehicle.

(2) If a person enters into a contract for the sale and purchase of a motor vehicle, the vendor or seller is deemed to warrant to the purchaser that the vehicle will pass an inspection unless the contract expressly provides that there is no such warranty.

Regulations

22 (1) The Minister may make regulations

(a) prescribing additional circumstances in which motor vehicles shall be exempt or classes of motor vehicles which shall be exempt from sections 4, 5, 6, 11 and 13;

(b) prescribing the design and matters incidental to the application and issuance of

(i) new vehicle stickers,

(ii) compliance stickers,

(iii) exemption stickers,

(iv) interim stickers,

(v) repair stickers, and

(vi) waivers.

(2) The Minister, with the aid of the Director of Standards and Approvals, may make regulations

(a) prescribing smokemeters and the method or type of method to be used for determining or measuring smoke;

(b) prescribing approved exhaust emissions analyzers which

(i) provide a simple, automatic "pass/fail" reading, and

(ii) are tamper resistant;

(c) prescribing the method or type of method to be used in determining exhaust emission levels;

(d) prescribing the procedure to be followed by an inspector when conducting an inspection or exhaust emissions test;

(e) prescribing

(i) the method of licensing inspectors,

(ii) required qualifications of inspectors, and

(iii) all matters incidental to the licensing of inspectors;

(f) prescribing

(i) the method of licensing private garages and businesses as facilities,

(ii) required qualifications of facilities,

(iii) all matters incidental to licensing facilities;

(g) prescribing the maximum fee which may be charged by a facility or inspector for an inspection, such fee not to exceed $20;

(h) prescribing the emissions standard which each motor vehicle must meet, such standards not to exceed the federal standards for that vehicle;

(i) prescribing fees, subject to subsection (g), that may be charged by the Department for any stickers, licences, or waivers granted or issued under this Act;

(j) prescribing fines to which a person is liable upon breach of the regulations.

PART IV

ENFORCEMENT

Certificate *prima facie* Evidence

23 In any prosecution, proceeding or hearing under this Act or the regulations, the production of a certificate or report of an analyst of the Department or an inspector as to the analysis, description, ingredients, quality, quantity or temperature of any material, whether solid, liquid or gas, or any combination of them, is *prima facie* evidence of the facts stated therein and of the authority of the person making the certificate or report without any proof of appointment or signature.

Provincial Officers

24 The Minister may designate in writing one or more officers or employees of the Department or other persons as provincial officers for the purposes of any section or Part of this Act or any regulation relating thereto.

Powers of Officers

25 (1) For the purpose of the administration of this Act and the regulations, a provincial officer may, from time to time and upon presentation of his designation, enter at any reasonable time any facility or motor vehicle and make or require to be made such surveys, examinations, investigations, tests and enquiries, including examinations of books, records, documents, machines and instruments, as he considers necessary, and may make, take and remove or may require to be made, taken or removed samples, copies or extracts.

(2) Where a justice of the peace is satisfied,

upon an ex parte application by a provincial officer, that there is reasonable ground for believing that it is necessary to enter any facility, building, structure, machine or motor vehicle for the administration of this Act or the regulations, the justice of the peace may issue an order authorizing a provincial officer to enter therein or thereon and to make or require to be made such surveys, examinations, investigations, tests and enquiries, but every such entry, survey, examination, investigation, test, inquiry or other such action shall be made or taken between sunrise and sunset unless the justice of the peace authorizes the provincial officer, by the order, to so act at another time.

Obstruction

26 No person shall hinder or obstruct a provincial officer in the lawful performance of his duties or furnish a provincial officer with false information or refuse to furnish him with information required for the purposes of this Act and the regulations.

Police Officers

27 (1) Any federal, provincial or local police officer, for the purpose of carrying out the provisions of this Act and the regulations, may require the driver of any motor vehicle to stop and may examine the motor vehicle and require the driver of the motor vehicle to submit the motor vehicle, together with its equipment and any trailer attached thereto, to such examinations and tests at such place or places and time or times as the police officer considers expedient.

(2) Every driver of a motor vehicle shall stop or submit the motor vehicle, together with its equipment and any trailer attached, to such examinations and tests as may be required by a police officer.

PART V

PENALTIES

Powers of Court

28 If a person is found guilty of an offence under this Act or the regulations, the court in which proceedings in respect of the offence are taken may, in addition to any punishment it may impose,

(a) revoke any licence, authority, waiver, sticker, accreditation or motor vehicle registration granted under this Act or the regulations; or

(b) order that person to comply with the provisions of this Act or the regulations for the contravention of which he has been found guilty.

Offenses

29 Every person who contravenes sections 3, 4, 10, or 11 of this Act is guilty of an offence and is liable

(a) in the case of an individual, to a fine of $50 for each offence; and

(b) in the case of a body corporate, to a fine of $100 for each offence.

30 Every person who contravenes sections 5, 7,or 8(b) of this Act is guilty of an offence and is liable

(a) in the case of an individual, to a fine of not less than $200 and not more than $500 for the first offence, and to a fine of not less than $500 and not more than $1 000 for any subsequent offence, or in any such case, to imprisonment for not more than one month or both such imprisonment and fine; and

(b) in the case of a body corporate, to a fine of not less than $500 and not more than $10 000 for the first offence, and to a fine of not less than $2 000 and not more than $20 000 for any subsequent offence.

Section 9 Offence

31 Every person who contravenes section 9 of this Act is guilty of an offence and is liable

(a) in the case of an individual, to a fine of not less than $500 and not more than $1 000 for the first offence, and to a fine of not less than $1 000 and not more than $5 000 for any subsequent offence, or in any such case, to imprisonment for not more than six months or both such imprisonment and fine; and

(b) in the case of a body corporate, to a fine of not less than $1 000 and not more than $10 000 for the first offence, and to a fine of not less than $5 000 and not more than $20 000 for any subsequent offence.

Section 12(4) Offence

32 Every person who, without reasonable cause, contravenes section 12(4) of this Act is guilty of an offence and is liable

(a) in the case of an individual, to a fine of

$300 for each offence; and

(b) in the case of a body corporate, to a fine of $500 for each offence.

Each Day Separate Offence 33 For the purposes of sections 31, 32, and 33, each day of continued violation is a separate offense.

General Offence 34 Every person who, without reasonable cause, contravenes a provision of this Act or the regulations for which no penalty is provided is guilty of an offence and is liable

(a) in the case of a body corporate, a fine of not more than $20 000, and

(b) in the case of an individual, a fine of not more than $1 000.

FEDERAL LEGISLATION

"opacity" means the fraction of a beam of light, expressed as a percentage, that fails to penetrate the exhaust emission; (*opacité*)

"oxides of nitrogen" means the sum of the nitric oxide and nitrogen dioxide that would be contained in a gas if the nitric oxide were in the form of nitrogen dioxide; (*oxydes d'azote*)

"system or device" means any modification of a vehicle or vehicle engine that prevents or lessens the emission of air pollutant to the atmosphere; (*système ou dispositif*)

"vehicle engine" means an engine of 50 cubic inches or more capacity, and includes the exhaust emission system but does not include the engine of an off-road utility vehicle. (*moteur de véhicule*)

General

1101. (1) A system or device

(*a*) shall not cause emission into the atmosphere of any air pollutant that would not be emitted into the atmosphere during the operation of the vehicle or vehicle engine if it were not equipped with the system or device; and

(*b*) shall not result in any unsafe condition endangering persons or property.

(2) Compliance with the requirements of this Schedule shall be demonstrated by approved test methods, and in the case of a heavy duty vehicle such requirements shall be those applicable at the time of manufacture of the engine.

(3) A system or device shall be deemed to meet the requirements of this Schedule if it is of the same construction, in all respects material to compliance with this Schedule, as a system or device that meets such requirements when tested in accordance with subsection (2).

(4) Every gasoline powered light duty vehicle shall have a plastic or metal label permanently attached in a readily visible position in the engine compartment to equipment that is not easily detached from the vehicle and in such a manner that it cannot be removed without being destroyed or defaced, which label shall state

(*a*) that the label contains vehicle emission control information;

(*b*) the full corporate name and trademark of the manufacturer;

(*c*) the engine size in cubic inches;

(*d*) the engine tune up specification and adjustments as recommended by the manufacturer, including recommended idle speed, ignition timing and air-fuel mixture setting or idle carbon monoxide setting;

(*e*) the proper transmission position during tune up and the accessories that should be in operation; and

(*f*) any other information that the manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle.

«opacité» désigne la fraction, exprimée en pourcentage, d'un faisceau lumineux qui ne réussit pas à traverser les gaz d'échappement; (*opacity*)

«oxydes d'azote» signifie le total d'oxyde nitrique et de bioxyde d'azote que contiendrait un gaz si l'oxyde nitrique prenait la forme de bioxyde d'azote; (*oxides of nitrogen*)

«poids brut» désigne le poids brut nominal d'un véhicule établi par le fabricant; (*gross vehicle weight*)

«système ou dispositif» désigne toute modification d'un véhicule ou du moteur d'un véhicule qui empêche ou réduit l'émission dans l'atmosphère de polluants de l'air; (*system or device*)

«véhicule utilitaire pour service hors route» désigne un véhicule d'un poids brut d'au plus 6,000 livres, conçu pour transporter des personnes, des biens ou un dispositif de travail et ayant des éléments caractéristiques spéciaux pour service hors route. (*off-road utility vehicle*)

Dispositions générales

1101. (1) Un système ou dispositif

a) ne doit pas causer l'émission dans l'atmosphère de n'importe quel polluant de l'air qui n'aurait pas été émis dans l'atmosphère durant le fonctionnement du véhicule ou du moteur du véhicule non équipé d'un tel système ou dispositif; et

b) ne doit pas causer de conditions dangereuses pour les personnes ou les biens.

(2) La conformité aux prescriptions de la présente annexe doit être établie par des méthodes d'essai approuvées et, dans le cas des véhicules lourds, ces prescriptions sont celles qui sont applicables à la date de fabrication du moteur.

(3) Un système ou dispositif est jugé conforme aux prescriptions de la présente annexe s'il est construit de la même façon qu'un système ou dispositif dont la conformité auxdites prescriptions a été établie par des essais faits conformément au paragraphe (2).

(4) Tout véhicule léger à moteur à essence doit porter une étiquette de plastique ou de métal, fixée en permanence et bien en vue dans le compartiment du moteur à une pièce qui n'est pas facilement détachable du véhicule et de telle façon qu'il ne soit pas possible de l'enlever sans la détruire ou la mutiler, l'étiquette devant donner

a) l'indication que cette étiquette contient des renseignements sur le contrôle des gaz émis par le véhicule;

b) la raison sociale, en toutes lettres, et la marque de commerce du fabricant;

c) la cylindrée du moteur en pouces cubes;

d) les instructions pour la mise au point et les réglages recommandés par le fabricant, y compris les instructions concernant la vitesse de ralenti, le calage de l'allumage et le réglage du mélange gazeux ou de la production d'oxyde de carbone au ralenti;

e) la position que doivent avoir la boîte de vitesse et les accessoires en fonctionnement pendant la mise au point; et

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(5) Every vehicle provided with an emission control device the performance of which will be impaired by the use of leaded gasoline shall have

(*a*) a warning to that effect that is visible to the operator of the vehicle;

(*b*) a warning to that effect that is

(i) immediately adjacent to the gasoline tank filler inlet, and

(ii) in both official languages; and

(*c*) a gasoline tank filler inlet that

(i) allows the insertion of a nozzle spout terminal end that has an outside diameter not greater than 0.84 inch (2.134 centimetres),

(ii) has a restriction preventing the insertion of a nozzle spout terminal end that has an outside diameter greater than 0.93 inch (2.362 centimetres), and

(iii) is designed to pass not more than 700 cc of gasoline into the tank when introduction of gasoline is attempted from a nozzle referred to in subparagraph (ii).

Crankcase Emissions

1102. The crankcase of a gasoline powered vehicle engine shall be constructed in such manner and be capable of being maintained in such condition that crankcase emissions are not discharged into the atmosphere.

Exhaust Emissions

1103. (1) The hydrocarbons, carbon monoxide and oxides of nitrogen content of the exhaust emissions from gasoline powered or diesel powered vehicle engines, when subjected to approved test methods, shall,

(*a*) in the case of a light duty vehicle, not exceed per vehicle mile (1.61 kilometres)

(i) 2 grams of hydrocarbons,

(ii) 25 grams of carbon monoxide, and

(iii) 3.1 grams of oxides of nitrogen; or

(*b*) in the case of a heavy duty vehicle, not exceed per brake horsepower-hour (2.684 megajoules)

(i) 16 grams of hydrocarbons combined with oxides of nitrogen, and

(ii) 40 grams of carbon monoxide.

(2) Every catalytic emission control device fitted on a light duty vehicle shall be designed to meet the requirements set out in subsection (1), when subjected to approved test methods, or the vehicle shall be equipped with an audible or visual warning signal, or both, to alert the operator of the vehicle of the need for maintenance of the catalytic device.

(3) The warning signal referred to in subsection (2) shall be activated

(*a*) at a preset time or mileage, at the option of the manufacturer; or

f) tout autre renseignement que le fabricant estime nécessaire ou utile pour assurer le bon fonctionnement et le bon entretien du véhicule.

(5) Tout véhicule muni d'un dispositif antipollution dont le rendement sera affaibli par l'usage d'essence au plomb, doit

a) porter un avertissement à ce sujet qui soit visible pour le conducteur du véhicule;

b) porter un avertissement à ce sujet

(i) qui soit placé dans le voisinage immédiat de l'orifice du tuyau de remplissage du réservoir d'essence, et

(ii) écrit dans les deux langues officielles; et

c) avoir un tuyau de remplissage du réservoir d'essence dont l'orifice

(i) permette l'insertion d'un bec d'ajutage ayant un diamètre extérieur d'au plus 0.84 de pouce (2,134 centimètres),

(ii) présente un resserrement qui empêche l'insertion d'un bec d'ajutage ayant un diamètre extérieur de plus de 0.93 de pouce (2,362 centimètres), et

(iii) soit conçu de façon à ne pas laisser passer plus de 700 cc d'essence dans le réservoir si on tente de le remplir au moyen d'un bec d'ajutage visé au sous-alinéa (ii).

Gaz de carter

1102. Le carter du moteur d'un véhicule à essence doit être construit de façon telle et pouvoir être maintenu dans un état tel que les gaz de carter ne soient pas rejetés dans l'atmosphère.

Gaz d'échappement

1103. (1) La teneur en hydrocarbures, en oxyde de carbone et en oxyde d'azote des gaz d'échappement d'un véhicule à essence ou à moteur diesel, mis à l'essai selon des méthodes approuvées, ne doit pas dépasser

a) dans le cas d'un véhicule léger, par mille de distance parcourue (1,61 kilomètre)

(i) 2 grammes d'hydrocarbures,

(ii) 25 grammes d'oxyde de carbone, et

(iii) 3,1 grammes d'oxyde d'azote; ou

b) dans le cas d'un véhicule lourd, par horsepower de puissance au frein par heure (2,684 mégajoules)

(i) 16 grammes d'hydrocarbures combinés à des oxydes d'azote, et

(ii) 40 grammes d'oxyde de carbone.

(2) Tout dispositif antipollution à effet catalytique dont est muni un véhicule léger doit répondre aux prescriptions du paragraphe (1) lorsqu'il est mis à l'essai selon des méthodes approuvées, ou le véhicule doit être équipé d'un signal d'avertissement sonore ou visuel, ou des deux, pour avertir le conducteur du véhicule que le dispositif catalytique a besoin d'entretien.

(3) Le signal d'avertissement mentionné au paragraphe (2) doit entrer en action

a) à un moment ou à une distance préréglés, au choix du fabricant; ou (*b*) upon failure of the catalytic device.

Opacity

1104. The opacity of the exhaust emissions from a diesel-powered heavy duty vehicle engine shall not exceed

(*a*) 20 per cent during acceleration;

(*b*) 15 per cent during engine lugging; and

(*c*) 50 per cent during peak conditions of engine acceleration and engine lugging.

Evaporative Emissions

1105. The evaporative emissions from a gasoline powered light duty vehicle having an engine displacement of 50 cubic inches (819.35 cubic centimetres) or more shall not exceed 2 grams of hydrocarbons when subjected to approved test methods.

Noise

1106. (1) Every vehicle shall be so constructed that

(*a*) it complies with Section 6 Specifications of ECE Regulation No. 9 Uniform Provisions Concerning the Approval of Vehicles With Regard to Noise (October 1968); or

(*b*) the noise emitted by it is

(i) in the case of a heavy duty vehicle, not in excess of 88 dbA when measured in accordance with SAE Recommended Practice J366 Exterior Sound Level For Heavy Trucks and Buses, (July 1969), and

(ii) in the case of a light duty vehicle and an off-road utility vehicle, not in excess of 86 db(A) when measured in accordance with SAE Standard J986*a* Sound Level For Passenger Cars and Light Trucks (July 1968).

(2) Every truck, bus and chassis-cab that has a GVWR in excess of 4 536 kg (10,000 pounds) shall be so constructed that the interior sound level at the driver's seating position does not exceed 90 dB(A) when measured as follows:

(*a*) the vehicle is located so that no other vehicle or signboard, building, hill or other large reflecting surface is within 15.24 metres (50 feet) of the driver's seating position;

(*b*) all vehicle doors, windows and ventilators are closed;

(*c*) all power-operated accessories are turned off;

(*d*) the driver and the person conducting the test are the only persons in the vehicle;

(*e*) a sound level meter that meets the requirements of the American National Standards Institute, Standard ANSI S 1.4-1971, "Specification for Sound Level Meters" for Type 1 or Type 2 meters and that is set at the A-weighting network "fast" meter response is used;

(*f*) the driver's seat is adjusted to the midpoint of its horizontal and vertical travel and the microphone is located pointing vertically upward at a point 740 mm (29 inches) vertically above the seat reference point and 250 mm (10 inches) laterally

(i) to the right of the seat reference point, in the case of a left hand drive vehicle, or

b) en cas de défaillance du dispositif catalytique.

Opacité

1104. L'opacité des gaz d'échappement du moteur diesel d'un véhicule lourd ne doit pas dépasser

a) 20 pour cent en accélération;

b) 15 pour cent en traction; et

c) 50 pour cent pendant les conditions de pointe en accélération et en traction.

Gaz d'évaporation

1105. La teneur en hydrocarbures des gaz d'évaporation d'un véhicule léger à essence ayant un moteur d'une cylindrée de 50 pouces cubes (819,35 centimètres cubes) ou plus ne doit pas dépasser 2 grammes d'hydrocarbures, lorsque le véhicule est mis à l'essai selon des méthodes approuvées.

Bruit

1106. (1) Tout véhicule doit être construit de façon

a) qu'il soit conforme à l'article 6 des normes du règlement nº 9 de la CEE, Dispositions uniformes concernant l'approbation des véhicules en ce qui a trait au bruit (octobre 1968); ou

b) que le bruit émis par le véhicule ne dépasse pas,

(i) dans le cas d'un véhicule lourd, 88 db(A) lorsqu'il est mesuré selon la pratique recommandée SAE J366 «Exterior Sound Level for Heavy Trucks and Buses», (juillet 1969), et,

(ii) dans le cas d'un véhicule léger et d'un véhicule utilitaire pour service hors route, 86 dbA lorsqu'il est mesuré selon la norme SAE J986*a* «Sound Level For Passenger Cars and Light Trucks» (juillet 1968).

(2) Tout camion, autobus et châssis dont le PNBV est supérieur à 4 536 kg (10,000 livres) est construit de façon que le niveau du son émis à l'intérieur et perçu à la place assise du conducteur, ne dépasse pas 90 dB(A) lorsqu'il est mesuré comme suit:

a) le véhicule est situé de façon qu'il n'y ait aucune grande surface réfléchissante, tel que colline, édifice, enseigne ou autre véhicule, en deçà de 15,24 mètres (50 pieds) de la place assise du conducteur;

b) toutes les portes, fenêtres et orifices de ventilation du véhicule sont fermés;

c) tous les accessoires électriques sont mis hors circuit;

d) le conducteur et la personne chargée de l'essai sont les seuls occupants du véhicule;

e) un sonomètre conforme aux exigences de la norme ANSI S 1.4-1971 de l'«American National Standards Institute Specification for Sound Level Meters», relatives aux sonomètres de Type 1 ou de Type 2, réglé pour obtenir une réponse rapide sur le réseau de pondération A, est utilisé;

f) le siège du conducteur est réglé à mi-chemin de son parcours horizontal et vertical et le microphone est placé pointant vers le haut à un point situé verticalement à 740 mm (29 pouces) au-dessus du point de référence du siège et latéralement à 250 mm (10 pouces)

45. Pollution control devices on motor vehicles.—(1) A person shall not sell, offer for sale, expose or display for sale or deliver over to a purchaser a motor vehicle or a motor vehicle engine of a class or type required by the regulations to have installed on or incorporated in it a system or device to prevent or lessen the emission into the outdoor atmosphere of an air contaminant, unless the motor vehicle complies with the regulations.

(2) A person shall not operate a motor vehicle of a class or type required by the regulations to have installed on or incorporated in it a system or device to prevent or lessen the emission into the outdoor atmosphere of an air contaminant, unless the motor vehicle has the system or device installed on or incorporated in it and makes effective use of the system or device.

(3) Every person who contravenes this section commits an offence and is liable on conviction to a fine of not less than $50 and not more than $500.

(4) The Lieutenant Governor in Council may make regulations

(a) classifying motor vehicles and motor vehicle engines for the purpose of a regulation and exempting a class or type of motor vehicle or motor vehicle engine from a regulation;

(b) requiring motor vehicles or a class or type of them and motor vehicle engines or a class or type of them to have installed on or incorporated in them one or more systems or devices to prevent or lessen the emission into the outdoor atmosphere of an air contaminent;

(c) prescribing the standards and specifications of the systems or devices, and providing for their testing and inspection;

(d) prescribing the standards of emission into the outdoor atmosphere of contaminants to which the system or device shall comply;

(e) providing for issuance by the superintendent of certificates of approval for systems or devices proposed to be installed on or incorporated in motor vehicles to prevent or lessen emission into the outdoor atmosphere of air contaminant;

(f) defining and designating new motor vehicles and motor vehicle engines for the purpose of a regulation; and

(g) designating the areas in the Province to which the regulations are applicable and designating the date on which the regulations become effective in an area.

[6·45]

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69. Penalties.—Except as this Act otherwise provides, a person contravening or committing a breach of or committing an offence against this Act or the regulations, or refusing, omitting or neglecting to fulfil, observe, carry out or perform a duty or obligation by this Act or the regulations created, prescribed or imposed, is liable on conviction to a fine of not more than $500 or to a term of imprisonment not exceeding 3 months, or both. [6·69]

. . .

84. Power to make regulations.—The Lieutenant Governor in Council may make regulations which shall be published in the Gazette and have the same force and effect as if incorporated in this Act. [6·84]

85. Specific powers to make regulations.—(1) Without limiting the generality of any provision of this Act, it is declared that the power of the Lieutenant Governor in Council to make regulations extends to

(a) prescribing the equipment for motor vehicles and trailers, and the inspection, testing, adjustment, display and use of that equipment including number plates, lamps, warning bells, horns, warning signals, mechanical and other signalling devices, windshields, mirrors, brakes, fenders, exhaust pipes, mufflers, muffler cutouts and other devices and equipment, whether or not of a different kind to those expressly mentioned;

(b) regulating or prohibiting the use on a highway of a vehicle or class of vehicles that may be a hazard to other users by reason of unusual size, weight or operating characteristics;

(c) regulating the training of drivers of motor vehicles and persons and firms engaged in the training;

(d) preventing the making of excessive noise by motor vehicles, setting maximum noise levels and preventing the sale, distribution or use in the Province of a vehicle or vehicle engine not designed, manufactured or equipped so that those levels will not be exceeded;

(e) classifying motor vehicles according to their estimated safe carrying capacity, prescribing the maximum load of goods or passengers which may be carried by the respective classes and prescribing safety standards for the carriage of passengers on certain classes of commercial motor vehicles;

. . .

(*x*) prescribing the standards required for motor vehicles, trailers, equipment and safety helmets that are sold, offered for sale, exposed or displayed for sale, or delivered to a purchaser for use;

. . .

(2) The Lieutenant Governor in Council or the superintendent may, in making a regulation [or approval] under this Act, incorporate in it by reference any code, standard, rule or part of them, relating to the subject matter of the Act, as they may be amended from time to time before or after the making of the regulation, that he may consider applicable, and may exempt any person or motor vehicle in the Province from the regulation. Where a code, standard, rule or part of it is adopted by regulation, publication in the Gazette of a notice of the adoption which refers to the code, standard or rule and states the extent of its adoption and sets forth the variations to which the adoption is subject, shall be deemed sufficient publication without publishing in the Gazette the text of the code, standard, rule or part adopted.

[S.B.C. 1980, c. 37, s. 27(*c*)] [6·85]

. . .

205. Depositing articles on highway.—(1) A person shall not throw, deposit, drop or leave on a highway a glass bottle, glass, nail, tack, wire, can or other thing or substance likely to injure a person, animal or vehicle on the highway.

(2) A person shall not place, deposit or dump, or cause to be placed, deposited or dumped, garbage, swill, cans, bottles, papers, ashes, refuse, the carcass of a dead animal, offal, trash, rubbish or a noisome, nauseous or offensive matter in or on a highway, including a portion of the right of way of it.

(3) A person shall not place, deposit or dump, or cause to be placed, deposited or dumped, rocks or dirt in or on a highway, including a portion of the right of way of it, without the consent of the party with jurisdiction over the highway at issue, which may be either the Minister of Transportation and Highways or the council of a municipality, or a person authorized by one of them to exercise the jurisdiction. [6·205]

. . .

213. Signs.—(1) A person shall not erect or maintain, or cause to be erected or maintained, a sign, advertisement or guide post on or over

(*a*) an arterial highway or a highway in rural area, except with the approval of the Minister of Transportation and Highways;

(*b*) a highway, other than an arterial highway in a municipality,

BRITISH
COLUMBIA

Pollution control devices on motor vehicles

45. (1) A person shall not sell, offer for sale, expose or display for sale or deliver over to a purchaser a motor vehicle or a motor vehicle engine of a class or type required by the regulations to have installed on or incorporated in it a system or device to prevent or lessen the emission into the outdoor atmosphere of an air contaminant, unless the motor vehicle complies with the regulations.

(2) A person shall not operate a motor vehicle of a class or type required by the regulations to have installed on or incorporated in it a system or device to prevent or lessen the emission into the outdoor atmosphere of an air contaminant, unless the motor vehicle has the system or device installed on or incorporated in it and makes effective use of the system or device.

(3) Every person who contravenes this section commits an offence and is liable on conviction to a fine of not less than $50 and not more than $500.

(4) The Lieutenant Governor in Council may make regulations

(a) classifying motor vehicles and motor vehicle engines for the purpose of a regulation and exempting a class or type of motor vehicle or motor vehicle engine from a regulation;

(b) requiring motor vehicles or a class or type of them and motor vehicle engines or a class or type of them to have installed on or incorporated in them one or more systems or devices to prevent or lessen the emission into the outdoor atmosphere of an air contaminant;

(c) prescribing the standards and specifications of the systems or devices, and providing for their testing and inspection;

(d) prescribing the standards of emission into the outdoor atmosphere of contaminants to which the system or device shall comply;

(e) providing for issuance by the superintendent of certificates of approval for systems or devices proposed to be installed on or incorporated in motor vehicles to prevent or lessen emission into the outdoor atmosphere of air contaminant;

(f) defining and designating new motor vehicles and motor vehicle engines for the purpose of a regulation; and

(g) designating the areas in the Province to which the regulations are applicable and designating the date on which the regulations become effective in an area.

1970-28-5; 1971-58-10.

Substitution of new licence where number plate or badge lost

46. (1) In case of the loss, mutilation or destruction of a number plate held by a licensee under this Act, if the licensee gives the superintendent an application in the form the superintendent requires, accompanied by satisfactory proof of the loss, mutilation or destruction, and delivers to the superintendent the licence, and, if possible, the number plates issued with it, and pays the prescribed fee, the superintendent shall cancel the licence and issue to the licensee a new licence with its corresponding number plates.

(2) The superintendent shall issue a new decal to a licensee who furnishes satisfactory proof of loss of a decal issued to him, makes application in the form the superintendent requires, and pays the prescribed fee.

RS1960-253-41; 1972-35-11; 1980-37-18, proclaimed effective November 13, 1980; 1983-10-21, effective October 26, 1983 (B.C. Reg. 393/83)

MANITOBA

Dispositif d'avertissement sur les véhicules lents

178(1) Sous réserve du paragraphe (2), il est interdit de conduire sur route du matériel agricole ou un véhicule circulant à une vitesse inférieure à 40 kilomètres à l'heure, à moins que celui-ci ne soit muni à l'arrière d'un dispositif réfléchissant d'un type approuvé par le Conseil routier et indiquant qu'il s'agit d'un véhicule lent, ou que ce véhicule ne soit légalement muni d'un feu orangé intermittent ou clignotant, lequel feu est allumé et émet une lumière visible de l'arrière.

Exceptions au paragraphe (1)

178(2) Le paragraphe (1) ne s'applique pas au véhicule, au cyclomoteur ou au véhicule de déplacement qui circule à une vitesse inférieure à 40 kilomètres à l'heure :

- a) afin de se conformer à une disposition de la présente loi ou des règlements pris pour son application, ou aux ordres d'un agent de la paix, ou encore aux indications d'un dispositif de signalisation;
- b) lorsque ce véhicule vient de se remettre en marche après un arrêt et est en cours d'accélération, ou lorsque ce véhicule est en train de ralentir en vue de s'arrêter;
- c) lorsque ce véhicule est en panne et est en cours de remorquage ou lorsque, en raison d'une défectuosité mécanique, il est impossible de le conduire à une vitesse supérieure à 40 kilomètres à l'heure.

L.M. 1985-86, c. 3, art. 178.

Bruit ou fumée excessif

179(1) Il est interdit à toute personne qui conduit un véhicule automobile ou en a la charge :

- a) d'actionner ou de laisser quelqu'un d'autre actionner une cloche, un klaxon ou autre avertisseur sonore de façon à faire du bruit inutilement;
- b) de permettre qu'une quantité inutile de fumée s'échappe du véhicule automobile;
- c) de faire en sorte que le véhicule automobile fasse du bruit inutilement en coupant le silencieux ou de toute autre manière;
- d) de conduire sur route un véhicule automobile si celui-ci n'est pas muni d'un silencieux en bon état de fonctionnement.

L'alinéa a) ne s'applique toutefois pas aux véhicules de la police, du service de lutte contre l'incendie ou aux ambulances, qui se rendent à un appel d'urgence, ou aux véhicules automobiles circulant sous l'autorité du Coordonnateur provincial de la Défense civile.

Bruit inutile

179(2) Il est interdit de démarrer, de conduire, de faire tourner ou d'arrêter un véhicule automobile, ou d'accélérer le moteur d'un véhicule automobile qui est immobile, de façon à faire produire un bruit assourdissant et inutile par le moteur, par le système d'échappement, par le système de freinage, ou par le crissement des pneus sur la chaussée.

L.M. 1985-86, c. 3, art. 179.

Warning device on slow vehicles.

178(1) Subject to subsection (2), no person shall drive or operate on a highway any implement of husbandry or any vehicle travelling at a speed less than 40 kilometres per hour unless there is displayed on the back thereof a reflectorized warning device of a type approved by the traffic board indicating that it is a slow moving vehicle, or the vehicle is permitted to be equipped with, and is equipped with, a lamp that emits an amber light and that lights intermittently or flashes, and the lamp is in operation and the light therefrom is visible from the rear.

Where subsection (1) not applicable.

178(2) Subsection (1) does not apply to a vehicle, moped or mobility vehicle that is being driven at a speed of less than 40 kilometres per hour

- (a) in order to comply with any provision of this Act or the regulations or with the order of a peace officer or with the directions indicated by means of a traffic control device; or
- (b) when the vehicle, having been stopped, has just been put into operation and the speed thereof is being accelerated, or when the speed of the vehicle is being decreased in order to bring it to a stop; or
- (c) when the vehicle is disabled and is being towed or when, due to mechanical failure, it is impossible to drive the vehicle at more than 40 kilometres per hour.

S.M. 1985-86, c. 3, s. 178.

Unnecessary noise or smoke.

179(1) No person in control or charge of a motor vehicle shall,

- (a) sound or permit the sounding of any bell, horn, or other signalling device so as to make an unnecessary noise; or
- (b) permit any unnecessary amount of smoke to escape from the motor vehicle; or
- (c) cause the motor vehicle to make an unnecessary noise by cutting out the muffler or otherwise; or
- (d) drive the motor vehicle upon a highway unless it is equipped with a muffler in good working order;

but clause (a) does not apply to police or fire department vehicles or to ambulances while such vehicles or ambulances are travelling in emergencies, or to a motor vehicle operated under the authority of the Provincial Co-ordinator of Civil Defence for Manitoba.

Unnecessary noise.

179(2) No person shall start, drive, turn or stop a motor vehicle, or accelerate the motor of a motor vehicle while it is stationary, in such a manner as to cause any loud and unnecessary noise in, or from, the engine, exhaust system or braking system, or from the contact of tires with the roadway.

S.M. 1985-86, c. 3, s. 179.

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(*e*) impairs or is likely to impair the safety of any person; or

(*f*) renders or is likely to render any property or plant or animal life unfit for use by man. 1972, c. 106, s. 3.

Exception

(2) Clause (1) (*a*) does not apply to animal wastes disposed of in accordance with normal farming practices. 1971, c. 86, s. 14 (2).

When Ministry to be notified

14.—(1) Every person who deposits, adds, emits or discharges a contaminant or causes or permits the deposit, addition, emission or discharge of a contaminant into the natural environment out of the normal course of events that,

(*a*) causes or is likely to cause impairment of the quality of the natural environment for any use that can be made of it;

(*b*) causes or is likely to cause injury or damage to property or to plant or animal life;

(*c*) causes or is likely to cause harm or material discomfort to any person;

(*d*) adversely affects or is likely to adversely affect the health of any person;

(*e*) impairs or is likely to impair the safety of any person; or

(*f*) renders or is likely to render any property or plant or animal life unfit for use by man,

shall forthwith notify the Ministry. 1972, c. 106, s. 4.

Exception

(2) Subsection (1) does not apply to animal wastes disposed of in accordance with normal farming practices. 1971, c. 86, s. 15 (2).

Repeal

(3) Subsections (1) and (2) are repealed on a day to be named by proclamation of the Lieutenant Governor. 1979, c. 91, s. 6.

Application of Part not restricted

15. Unless otherwise required by the context, the provisions of this Part also apply to the subject-matter of the individual Parts of this Act. 1971, c. 86, s. 16.

Minister may order repair of damage

16. Where any person causes or permits the deposit, addition, emission or discharge into the natural environment of a contaminant that injures or damages land, water, property or plant life, the Minister, where he is of the opinion that it is in the public interest so to do, may order such person to do all things and take all steps necessary to repair the injury or damage. 1971, c. 86, s. 17

Equipment to alleviate effect of contaminant

17. When, in the opinion of the Director, based upon reasonable and probable grounds, it is necessary or advisable for the protection or conservation of the natural environment to do so, the Director may, by an order directed to any person, require that person to have on hand and available at all times such equipment and material as the order specifies to alleviate the effect of any contamination of the natural environment that may be caused or permitted by the person to whom the order is directed. 1971, c. 86, s. 18.

Order or approval binds successor or assignee

18.—(1) An order or approval of the Minister or the Director under this Act is binding upon the successor or assignee of the person to whom it is directed.

Index record

(2) The Ministry shall maintain an alphabetical index record of the names of all persons to whom orders or approvals are directed under this Act.

Removal of name from index record

(3) When an order or approval has expired or is revoked, the Ministry shall remove from the index record the name of the person to whom the order or approval is directed.

Search of index record

(4) The Ministry shall, upon the request of any person, make a search of the index record and inform the person making the request as to whether or not the name of a particular person appears in the index record and shall permit inspection of any order or approval relating to that person. 1971, c. 86, s. 19; 1972, c. 1, s. 1.

The Crown

19. The provisions of this Act are binding upon the Crown. 1971, c. 86, s. 20.

PART III

MOTORS AND MOTOR VEHICLES

Interpretation

20. In this Part,

(*a*) "motor" means an internal combustion engine;

(*b*) "motor vehicle" means a vehicle that uses or incorporates a motor as a source of power. 1971, c. 86, s. 22; 1974, c. 20, s. 5.

Sale of motor vehicle that does not comply with regulations

21.—(1) No person shall sell, offer or expose for sale, a motor or motor vehicle that does not comply with the regulations.

Where system or device installed on motor vehicle

(2) Where a manufacturer installs on, attaches to or incorporates in any motor or motor vehicle, a system or device to prevent or lessen the emission of any contaminant, no person shall sell, offer or expose for sale, such motor or motor vehicle unless the motor or motor vehicle has such system or device so installed, attached or incorporated and such system or device, when the motor or motor vehicle is operating, complies with the regulations.

Repair or replacement of system or device

(3) Where a manufacturer installs on, attaches to or incorporates in any motor or motor vehicle, a system or device to prevent or lessen the emission of any contaminant, no person shall remove or cause or permit the removal of such system or device from such motor or motor vehicle, except for repair of such system or device or for replacement of such system or device by a system or device of the same type. 1973, c. 94, s. 2, *part*.

Operation of motor or motor vehicle

22.—(1) Except where necessary for test or repair purposes, no person shall operate or cause or permit the operation of a motor or motor vehicle or any class or type thereof that does not comply with the regulations.

Where system or device required

(2) Where a manufacturer installs on, attaches to or incorporates in any motor or motor vehicle a system or device to prevent or lessen the emission of any contaminant, the owner of such motor or motor vehicle shall not operate or cause or permit the operation of such motor or motor vehicle nor shall any person knowingly operate or cause or permit its operation unless such motor or motor vehicle has installed on, attached to or incorporated in it such system or device, and such system or device operates in accordance with the regulations when the motor or motor vehicle is in operation. 1973, c. 94, s. 2, *part*.

PART IV

WATER

Interpretation

23.—(1) In this section,

(*a*) "ice shelter" means any structure that is located on or over ice over any water for more than one day and that is or may be used for shelter, privacy or the storage or sale of any thing;

(*b*) "owner", when used in relation to an ice shelter, includes a person who has the right to use or occupy the ice shelter;

(*c*) "waste" means human excrement or any refuse that is discharged or deposited in or from an ice shelter.

Discharge or deposit of waste prohibited

(2) No person shall discharge or deposit or cause or permit to be discharged or deposited any waste upon or over the ice over any water except in accordance with the regulations.

Removal of ice shelter by provincial officer

(3) Except as provided in subsection (4), where an ice shelter is placed or allowed to remain on ice over any water in contravention of any provision of the regulations, a provincial officer may remove the ice shelter or cause it to be removed,

(*a*) where the provincial officer is able to determine the name and address of the owner, after service of notice upon the owner at least seven days before the date of the removal; or

(*b*) where the provincial officer is unable to determine the name and address of the owner, forthwith.

Idem, out of season

(4) Where an ice shelter is placed or allowed to remain on ice over any water beyond the dates prescribed by the regulations within which ice shelters may be placed, allowed to remain or used on or over ice over any water, a provincial officer may remove the ice shelter or cause it to be removed without serving prior notice upon the owner, but where the provincial officer is able to determine the name and address of the owner, notice of the removal shall be served upon the owner forthwith after the removal.

Where owner may retake possession of ice shelter

(5) Except where an ice shelter has been destroyed in the course of removal, the owner of an ice shelter that has been removed pursuant to subsection (3) or (4) may take possession of the ice shelter within thirty days of the removal or of service of the notice mentioned in subsection (3), whichever is later, or within thirty days after service of the notice mentioned in subsection (4), as the case requires, upon payment to the Treasurer of Ontario of the costs and charges for removal and storage of the ice shelter.

Where provincial officer may dispose of ice shelter

(6) Where the owner of an ice shelter that has been removed pursuant to subsection (3) or (4) does not take possession of the ice shelter pursuant to subsection (5),

PART XII

PROVINCIAL OFFICERS

Designation of provincial officers

125. The Minister may designate in writing one or more officers or employees of the Ministry or other persons as provincial officers for the purposes of any section or Part of this Act or any regulation or section of any regulation relating thereto. 1973, c. 94, s. 7.

Survey by provincial officer

126.—(1) A provincial officer may survey from time to time anything that he has reason to believe is or may be a source of contaminant, and after completing such survey shall report his findings and his recommendations.

Report to be sent to Ministry and person responsible

(2) The provincial officer shall file his report of his findings and recommendations with the Ministry and shall serve upon the person responsible for the source of contaminant a copy thereof. 1971, c. 86, s. 83; 1972, c. 1, s. 1.

Powers of provincial officer

127.—(1) For the purpose of the administration of this Act and the regulations, a provincial officer may, from time to time and upon production of his designation, enter at any reasonable time any building, structure, machine, vehicle, land, water or air and make or require to be made such surveys, examinations, investigations, tests and inquiries, including examinations of books, records and documents, as he considers necessary, and may make, take and remove or may require to be made, taken or removed samples, copies or extracts. 1973, c. 94, s. 8, *part*; 1974, c. 20, s. 25.

Order authorizing

(2) Where a justice of the peace is satisfied, upon an *ex parte* application by a provincial officer, that there is reasonable ground for believing that it is necessary to enter any building, structure, machine, vehicle, land, water or air for the administration of this Act or the regulations, the justice of the peace may issue an order authorizing a provincial officer to enter therein or thereon and to make or require to be made such surveys, examinations, investigations, tests and inquiries and to take the other actions mentioned in subsection (1) but every such entry, survey, examination, investigation, test, inquiry and other such action shall be made or taken between sunrise and sunset unless the justice of the peace authorizes the provincial officer, by the order, to so act at another time. 1973, c. 94, s. 8.

Information

(3) Every person responsible for a source of contaminant shall furnish such information as a provincial officer requires for the purposes of this Act or the regulations. 1971, c. 86, s. 84 (3).

Calling for assistance of member of police force

128.—(1) Whenever a provincial officer is required or empowered by this Act or the regulations to do or direct the doing of anything, such provincial officer may take such steps and employ such assistance as is necessary to accomplish what is required, and may, when obstructed in so doing, call for the assistance of any member of the Ontario Provincial Police Force or the police force in the area where the assistance is required and it is the duty of every member of a police force to render such assistance. 1971, c. 86, s. 85.

Inspection of motor vehicles

(2) A provincial officer, for the purpose of carrying out the provisions of this Act and the regulations, may require the driver of any motor vehicle to stop and may inspect the motor vehicle and require the driver of the motor vehicle to submit the motor vehicle, together with its equipment and any trailer attached thereto, to such examinations and tests at such place or places and time or times as the provincial officer considers expedient and where the provincial officer considers it necessary or expedient he may call for the assistance of any member of the Ontario Provincial Police Force or the police force in the area where the assistance is required and it is the duty of every member of a police force to render such assistance.

Duty of driver of motor vehicle

(3) Every driver of a motor vehicle shall stop or submit the motor vehicle, together with its equipment and any trailer attached, to such examinations and tests as may be required by a provincial officer or a member of a police force referred to in subsection (2). 1973, c. 94, s. 9.

Obstruction of provincial officer

129. No person shall hinder or obstruct a provincial officer in the lawful performance of his duties or furnish a provincial officer with false information or refuse to furnish him with information required for the purposes of this Act and the regulations. 1973, c. 94, s. 10.

Matters confidential

130.—(1) Except as to information in respect of the deposit, addition, emission or discharge of a contaminant into the natural environment, every provincial officer shall preserve secrecy in respect of all matters that come to his knowledge in the course of any survey, examination, test or inquiry under this Act or the regulations and shall not communicate any such matters to any person except,

(*a*) as may be required in connection with the administration of this Act and the regulations or any proceedings under this Act or the regulations;

(*b*) to his counsel; or

(c) with the consent of the person to whom the information relates.

Testimony in civil suit

(2) Except in a proceeding under this Act or the regulations, no provincial officer shall be required to give testimony, other than testimony in respect of the deposit, addition, emission or discharge of a contaminant into the natural environment, in any civil suit or proceeding with regard to information obtained by him in the course of any survey, examination, test or inquiry under this Act or the regulations. 1971, c. 86, s. 87.

PART XIII

ENVIRONMENTAL COUNCIL

Interpretation

131. In this Part, "Council" means the Environmental Council. 1971, c. 86, s. 88.

Environmental Council established

132.—(1) A council to be known as the Environmental Council may be established and shall consist of not fewer than seven and not more than eleven persons appointed by the Lieutenant Governor in Council, each to hold office for a term of not more than three years.

Chairman and vice-chairman

(2) The Lieutenant Governor in Council may appoint one of the members of the Council as chairman and another of the members as vice-chairman.

Members

(3) The composition of the Council shall be such as to provide for competent and knowledgeable persons in matters relating to the natural environment.

Vacancies

(4) Vacancies in the membership of the Council may be filled by the Lieutenant Governor in Council.

Remuneration

(5) The members of the Council shall be paid such remuneration and expenses as the Lieutenant Governor in Council from time to time may determine. 1971, c. 86, s. 89.

Duties of Council

133. The Council, through its chairman, shall,

(a) advise the Minister as to the results of current research related to,

(i) pollution, and

(ii) the natural environment; and

(b) consider any matter affecting the quality of the environment which the Council or the Minister deems advisable and advise the Minister thereon through its chairman. 1971, c. 86, s. 90.

PART XIV

MISCELLANEOUS

Where contaminant causes damage to crops or live stock

134.—(1) Where a person complains that a contaminant is causing or has caused injury or damage to live stock or to crops, trees or other vegetation which may result in economic loss to such person, he may, within fourteen days after the injury or damage becomes apparent, request the Minister to conduct an investigation.

Request for investigation

(2) Upon receipt of a request, the Minister may cause an investigation to be made and a report prepared of the findings of the investigation.

Report of investigation

(3) A copy of the report shall be given to the claimant and to the person responsible for the source of contaminant alleged to be the cause of the injury or damage.

Right of person responsible to view damage, etc.

(4) The claimant shall permit the person responsible for such source of contaminant or his agent to view the injury or damage and to remove samples and conduct tests and examinations as may be reasonably necessary to establish the cause of the injury or damage.

Board of negotiation

(5) A board of negotiation shall be established consisting of two or more members appointed by the Lieutenant Governor in Council, one of whom may be designated as chairman.

Quorum

(6) Any two members of the board of negotiation constitutes a quorum and are sufficient to perform all the functions of the board on behalf of the board.

Place of sitting

(7) The board of negotiation may sit at any place in Ontario.

Notice of amount of claim

(8) If a complainant who has requested an investigation under subsection (1) desires to have his claim for injury or damage negotiated by the board of negotiation, he shall

notify the Minister and the person responsible for the source of contaminant alleged to be the cause of the injury or damage of the amount of his claim within a reasonable time after the amount can be determined.

Notice of negotiation

(9) If the claimant and the person responsible are not able to settle the claim within thirty days after notice of the claim is given to the Minister under subsection (8), the claimant or the person responsible may serve notice of negotiation upon the other of them and upon the board of negotiation stating that he requires a settlement of the claim to be negotiated by the board of negotiation.

Negotiation proceedings

(10) Upon receipt of a notice of negotiation, the board of negotiation shall assess the injury or damage in respect of which the claim is made and, upon reasonable notice to the claimant and to the person responsible, shall meet with them and, without prejudice to any subsequent proceedings, proceed in a summary and informal manner to negotiate a settlement of the claim. 1971, c. 86, s. 92.

Consents, notices, etc., as evidence

135. Any consent, notice, licence, permit, approval, order or certificate purporting to be signed by the Director or the Minister or by such officer of the Ministry as is designated in the regulations, or any certified copy, is receivable in evidence in any action, prosecution or other proceeding as *prima facie* proof of the facts set out therein without proof of the signature or the official position of the person appearing to have signed it. 1971, c. 86, s. 93; 1972, c. 1, s. 1.

Regulations

136.—(1) The Lieutenant Governor in Council may make regulations,

(*a*) classifying contaminants and sources of contaminants and exempting any classes from the provisions of this Act and the regulations;

(*b*) prohibiting or regulating and controlling the depositing, addition, emission or discharge of any contaminant or contaminants into the natural environment from any source of contaminant or any class thereof;

(*c*) prescribing maximum permissible amounts, concentrations or levels of any contaminant or combination of contaminants and any class of either of them;

(*d*) prescribing methods or standards, or both, for determining the amount, concentration or level of any

contaminant, combination of contaminants or any class of either of them;

(*e*) defining the desirable quality criteria of the natural environment;

(*f*) classifying persons for the purposes of this Act and exempting any class from any provision thereof;

(*g*) classifying plants, structures and things, prescribing classes thereof that shall not be constructed, altered or modified unless the plans and specifications thereof are approved by the Director, and prescribing classes thereof for which the approval of the Director as to the plans and specifications is not required;

(*h*) prescribing the details that shall be set out in plans and specifications submitted to the Director for approval;

(*i*) prescribing the amounts of grants and loans and the terms and conditions of such grants and loans;

(*j*) prescribing the maximum permissible concentration or level in water of any contaminant either generally or with respect to any part of the water of Ontario specified in the regulations;

(*k*) prescribing methods for determining the concentration or level in water of any contaminant, either generally or with respect to any part of the water of Ontario specified in the regulations, for the purposes of the regulations;

(*l*) prescribing maximum permissible changes in temperatures of water, either generally or with respect to any part of the water of Ontario specified in the regulations;

(*m*) prescribing fees that may be charged and collected by the Ministry for copies of documents, maps, plans and drawings supplied by the Ministry;

(*n*) regulating the quality of fuels that may be used for heating, generating steam or electricity, for industrial processes or for incineration. 1971, c. 86, s. 94 (1); 1972, c. 1, s. 1; 1972, c. 106, s. 31 (1); 1973, c. 94, s. 11 (1).

Regulations relating to Part III

(2) The Lieutenant Governor in Council may make regulations relating to Part III,

(*a*) classifying motors and motor vehicles for the purpose of any regulation and exempting any class or type of motor or motor vehicle from any regulation;

(*b*) regulating or prohibiting the operation in all or any part of Ontario of any class or type of motor or motor vehicle in order to lessen or prevent the emission of any contaminant into the natural environment;

(*c*) requiring motors or motor vehicles or any class or type of motor or motor vehicle to have installed thereon or incorporated therein one or more systems or devices to prevent or lessen the emission of any contaminant into the natural environment, prescribing the standards and specifications of any such system or device, prescribing the standards of emission of any contaminant into the natural environment with which any such system or device shall comply and providing for testing and inspection of any such system or device;

(*d*) prescribing the standards of emission into the natural environment of any contaminant by any motor or motor vehicle or any class or type of motor or motor vehicle and providing for the testing and inspection of any such motor, motor vehicle, class or type;

(*e*) regulating the quality of motor fuels and additives used or intended for use in motor fuels in Ontario. 1971, c. 86, s. 94 (2).

Regulations relating to Part IV

(3) The Lieutenant Governor in Council may make regulations relating to Part IV,

(*a*) requiring and regulating the storage, treatment and disposal of sewage in boats and ships or any class or classes thereof and the equipment therefor, and prohibiting the use and installation of equipment for the storage, treatment or disposal of sewage in boats and ships or any class or classes thereof unless the equipment and installation thereof conform to the regulations, and providing for and requiring the

approval of the Director for any such equipment, and prohibiting and regulating the discharge of sewage from such boats and ships or any class or classes thereof;

(*b*) regulating and controlling, for the purpose of preventing or reducing the pollution of any water, places or any class or classes thereof located on or adjacent to any water where moorings are provided for boats or ships or where any services are provided for boats or ships or the occupants thereof, and regulating and governing persons providing such moorings or services, or any class or classes thereof;

(*c*) defining sewage for the purposes of regulations made under clauses (*a*) and (*b*);

(*d*) prescribing forms and providing for their use for the purposes of Part IV;

(*e*) providing for the issue of permits and identification plates for ice shelters and requiring and governing their use;

(*f*) regulating the placing, construction and standard of repair of ice shelters and requiring and regulating the storage, treatment and disposal of waste and requiring the approval of the Director for any equipment and things related thereto by any person or class of persons and prohibiting the placing, allowing to remain or use of an ice shelter contrary to or in a condition that is contrary to the regulations or without any equipment or facilities required by the regulations;

(*g*) prescribing the dates within which ice shelters may be placed, allowed to remain or used on or over the ice over any water. 1971, c. 86, s. 94 (3); 1973, c. 94, s. 11 (2).

Regulations relating to Part V

(4) The Lieutenant Governor in Council may make regulations relating to Part V,

(*a*) designating wastes in addition to those specified in clause 24 (*d*), and exempting any wastes from the Part and the regulations or any provision thereof, and prescribing terms and conditions for such exemption;

(*b*) classifying waste management systems and waste disposal sites, and exempting any class thereof from the Part or the regulations or any provision thereof, Application of R.S.O. 1980, c. 302

(3) Part XIX of the *Municipal Act* applies to by-laws passed under this section. 1974, c. 125, s. 3.

Conflict

139.—(1) Where a conflict appears between any provision of this Act or the regulations and any other Act or regulation in a matter related to the natural environment or a matter specifically dealt with in this Act or the regulations, the provision of this Act or the regulations shall prevail. 1971, c. 86, s. 96.

Idem

(2) Subsection (1) does not apply in respect of section 138 and the enactment of section 138 or a by-law pursuant to section 138 does not affect the validity of an Act that is in force immediately before the coming into force of section 138. 1974, c. 125, s. 4.

Protection from personal liability

R.S.O. 1980, c. 418

140.—(1) Except in the case of an application for judicial review or an action or proceeding that is specifically provided for with respect to a person referred to in this subsection in any Act or in a regulation under this or any other Act, no action or other proceeding for damages or otherwise shall be instituted against an employee of the Ministry, a member of the Board or of the Environmental Assessment Board or a Crown employee within the meaning of the *Public Service Act* who is a provincial officer or is acting under the direction of an employee of the Ministry, or such member or provincial officer for any act done in good faith in the execution or intended execution of any duty or authority under this Act or for any alleged neglect or default in the execution in good faith of any such duty or authority.

Crown not relieved of liability R.S.O. 1980, c. 393

(2) Subsection (1) does not, by reason of subsections 5 (2) and (4) of the *Proceedings Against the Crown Act*, relieve the Crown of liability in respect of a tort committed by an agent or servant of the Crown to which it would otherwise be subject and the Crown is liable under that Act for any such tort in a like manner as if subsection (1) had not been enacted. 1974, c. 20, s. 27.

Certificate of analysis as evidence

141. In any prosecution, proceeding or hearing under this Act or the regulations, the production of a certificate or report of an analyst of the Ministry as to the analysis, description, ingredients, quality, quantity or temperature of any material, whether solid, liquid or gas, or any combination of them, is *prima facie* evidence of the facts stated therein and of the authority of the person making the certificate or report without any proof of appointment or signature. 1971, c. 86, s. 97.

Service

142.—(1) Any notice, decision or other document required to be given or served under this Act or the regulations is sufficiently given or served if delivered personally or sent by registered mail addressed to the person to whom delivery or service is required to be made at the latest address for service appearing on the records of the Ministry.

When service deemed made

(2) Where service is made by registered mail, the service shall be deemed to be made on the fifth day after the day of mailing unless the person on whom service is being made establishes that he did not, acting in good faith, through absence, accident, illness or other cause beyond his control receive the notice or order until a later date. 1971, c. 86, s. 98; 1972, c. 1, s. 1.

Enforcing performance of things required to be done

143. Where the Minister or the Director has authority to order or require that any matter or thing be done, the Minister may order that, in default of its being done by the person ordered or required to do it, such matter or thing shall be done at the expense of such person, and the Minister may recover the cost of doing it, with costs, by action in a court of competent jurisdiction as a debt due to the Crown by such person. 1971, c. 86, s. 99.

Power to restrain by action

144. Where any provision of this Act or the regulations or any direction, order, approval, notice or permit, made, granted, given, served or issued by the Minister or the Director under this Act is contravened, in addition to any other remedy and to any penalty imposed by law, such contravention may be restrained by action at the instance of the Minister. 1971, c. 86, s. 100.

False information

145. No person shall knowingly give false information in any application, return or statement made to the Minister, a provincial officer or any employee of the Ministry in respect of any matter under this Act or the regulations. 1974, c. 20, s. 28.

Offence

146.—(1) Except as otherwise provided in this Act, every person, whether as principal or agent, or an employee of either of them, who contravenes any provision of this Act or the regulations or fails to comply with an order or any term or condition of a certificate of approval or a licence made or issued under this Act is guilty of an offence and on conviction is liable on a first conviction to a fine of not more than $5,000 and on each subsequent conviction to a fine of not more than $10,000 for every day or part thereof upon which such offence occurs or continues. 1971, c. 86, s. 102 (1); 1972, c. 106, s. 32.

[4C]

MOTOR VEHICLES REGULATION

(R.R.O. 1980, Reg. 311)

Note.—This Regulation made pursuant to the *Environmental Protection Act*.

1. In this Regulation,

(*a*) "catalytic converter" means a device through which exhaust from a motor is passed in order to prevent or lessen the emission of a contaminant and which device would be impaired in its functioning by the use of leaded gasoline as a fuel for operation of the motor;

(*b*) "gross vehicle weight" means the manufacturer's gross weight rating;

(*c*) "leaded gasoline" means gasoline that is not unleaded gasoline;

(*d*) "light duty motor vehicle" means a motor vehicle having a gross vehicle weight of 2,720 kilograms or less, but does not include a motorcycle;

(*e*) "model year", when used with respect to a motor vehicle, means the model year designated by the manufacturer but, where the manufacturer does not make such a designation, means the calendar year in which the manufacture of a motor vehicle is completed;

(*f*) "motorcycle" means a motor vehicle having a seat or saddle for the use of the driver and designed to travel on not more than three wheels in contact with the ground and includes a bicycle with a motor attached and a motor scooter;

(*g*) "unleaded gasoline" means gasoline that contains not more than 0.013 grams of lead per litre and not more than 0.0013 grams of phosphorus per litre. [4C·1]

2. Motor vehicles for which a permit under the *Highway Traffic Act* has not been issued are exempt from all the provisions of this Regulation except section 4. [4C·2]

3.—(1) No person shall use leaded gasoline as a fuel to operate a motor vehicle manufactured with a catalytic converter.

(2) No person shall operate or cause or permit the operation of a motor vehicle with a catalytic converter after leaded gasoline has been used as a fuel in the motor vehicle until the catalytic converter has been repaired or replaced.

(3) A motor vehicle manufacturerd with a catalytic converter incorporated as part of a system to prevent or lessen the emission of any contaminant shall include, as part of the system, a gasoline tank filler inlet that,

(*a*) allows the insertion of a nozzle spout terminal end that has an outside diameter not greater than 2.134 centimetres;

(*b*) has a restriction preventing the insertion of a nozzle spout terminal end that has an outside diameter greater than 2.362 centimetres; and

(*c*) is designed to pass not more than 700 millilitres of gasoline into the tank when introduction of gasoline is attempted from a nozzle referred to in clause (*b*). [4C·3]

4. No person shall operate a light duty motor vehicle from which there is a visible emission of a contaminant or contaminants for more than fifteen seconds in any five-minute period. [4C·4]

5. In respect of a motor or motor vehicle manufactured with a system or device to prevent or lessen the emission of any contaminant, the system or device, or any replacement therefor,

(*a*) shall be maintained and kept in such a state of repair that it is capable of performing the function for which it was intended; and

(*b*) shall be kept installed on, attached to or incorporated in the motor or motor vehicle in such a manner that, when the motor or motor vehicle is operating, the system or device functions in the manner in which it was intended to function. [4C·5]

6.—(1) For a light duty motor vehicle of a model year and displacement listed in Column 1 of the Table, the figures appearing opposite in the remaining columns are prescribed as maximum emission standards for the vehicle with respect to the contaminant named at the head of each column when tested under the test conditions specified.

(2) Where a light duty motor vehicle is tested for compliance with the maximum emission standards prescribed by subsection (1),

(*a*) the motor shall be at its normal operating temperature,

(*b*) the transmission of the motor vehicle shall be in the neutral position;

(*c*) for the test conditions indicated in Column 2, 4 or 6 of the Table the accelerator pedal shall not be depressed;

(*d*) for the test conditions indicated in Column 3, 5 or 7 of the Table the accelerator pedal shall be depressed, so as to produce a rotational speed of the motor of between 2,450 and 2,550 revolutions per minute; and

(*e*) the test, except a test of visible emissions, shall be carried out using an infrared analyzer or other analytical device or procedure of equivalent accuracy.

(3) Every motor vehicle for which emission standards are prescribed in subsection (1) shall comply with such standards.

TABLE

MAXIMUM EMISSION STANDARDS

		Exhaust Emissions				Visible Emissions of a Contaminant or Contaminants (seconds in any one-minute period)	
		Hydrocarbons (parts per million by volume)		Carbon Monoxide (per cent by volume)			
		Test Conditions					
		idle	fast idle	idle	fast idle	idle	fast idle
1		2	3	4	5	6	7
Model Year	Displacement						
Before 1969	2.29 litres or less	800	800	6	5	5	5
Before 1969	more than 2.29 litres	600	600	5	3	5	5
1969	2.29 litres or less	600	600	5	3	5	5
1969	more than 2.29 litres	500	500	4	2	5	5
1970 or 1971	2.29 litres or less	500	500	4	2.5	5	5
1970 or 1971	more than 2.29 litres	400	400	3	1.5	5	5
1972, 1973, 1974	2.29 litres or less	500	500	3.5	2	5	5
1972, 1973, 1974	more than 2.29 litres	400	400	2.5	1	5	5
1975 or after	2.29 litres or less	400	400	2.5	1.5	5	5
1975 or after	more than 2.29 litres	300	300	2	1	5	5

[4C·6]

7.—(1) A provincial officer, designated for the purpose of carrying out the provisions of Part III of the Act, or a police officer may, by written notice in Form 1, require the driver or owner of a motor vehicle to submit such motor vehicle for testing and inspection.

(2) Every driver or owner of a motor vehicle shall comply with a written notice given to him under subsection (1). [4C·7]

Form 1

Environmental Protection Act

NOTICE TO SUBMIT MOTOR VEHICLE

TAKE NOTICE that pursuant to *The Environmental Protection Act* and the regulations thereunder,

Name: ....

Address: ....

Driver Licence Number: ....

is required to submit the motor vehicle bearing Ontario Registration

Plate Number .... (year) ....to the inspection

site at ....

on .... between the
(month) (day) (year)

hours of .... and .... for testing and inspection.

Dated at .... this .... day of ...., 19 .....

....
Provincial Officer
or
Police Officer

[4C·10]

[The next page number is Stats. Ont. 751]

QUEBEC

Nos. EPS 1-AP-75-1 and EPS 1-AP-75-1A;

(p) lead content of particulate matters emitted into the atmosphere by a contaminant source is determined according to the method described in the document entitled: Standard Reference Methods for Source Testing: Measurement of Emissions of Particulate Matter and Lead from Secondary Lead Smelters published by Environment Canada under No. EPS 1-AP-78-3;

(q) vinyl chloride is measured according to the method described in the document entitled: Standard Reference Methods for Source Testing: Measurement of Emissions of Vinyl Chloride from Vinyl Chloride and Polyvinyl Chloride Manufacturing under No. EPS 1-AP-77-1;

(r) nitrogen oxides are measured according to the method described in the document entitled: Standard Reference Methods for Source Testing: Measurement of Emissions of Nitrogen Oxides from Stationary Sources published by Environment Canada under No. EPS 1-AP-77-3;

(s) hexavalent chromium is measured according to the method described in the document entitled: A Simple Reliable Method for the Determination of Airborne Hexavalent Chromium published by M.T. Abell and J.R. Carlbert in the A.I.H.A. Journal, Volume 35, Number 4, April 1974;

(t) copper, selenium, arsenic, cadmium or tellurium content in particulate matters emitted into the atmosphere by a metal purification plant is determined by atomic absorption spectrophotometry.

(Divisions XXX.1 and XXX.2 added by O.C. 240-85, s. 8)

Division XXX.1 – Motor Vehicle Emissions

96.1 ***Sale or use of motor vehicles.*** Any light motor vehicle of a model subsequent to 1985 offered for sale, on display for sale, sold or used in Québec must be equipped with a device in good working order to reduce the emission of hydrocarbons, carbon monoxide and nitrogen oxides into the atmosphere.

This article does not apply to light motor vehicles designed to comply with the emission standards in Regulations under the *Motor Vehicle Safety Act* (RSC 1970, c. 26, 1st Supp.) without being equipped with a device covered by the first paragraph.

96.2 ***Removal of anti-pollution devices.*** No one may remove or modify or allow to be removed or modified any device installed in a motor vehicle to reduce or eliminate the emission of a contaminant into the environment, or, in the case of a light motor vehicle equipped with a catalytic converter, modify or allow to be modified the opening of the fuel tank or pour leaded gasoline therein.

96.3 ***Exceptions.*** Sections 96.1 and 96.2 do not apply to motor vehicles adapted to allow the use of propane or natural gas as their sole fuel or to motor vehicles used during a competition held under the sponsorship of an international organization.

Division XXX.2 – Penalties

96.4 ***Penalties.*** A natural person contravening section 29 or 31 is liable to a fine of not less than 300 $ and not more than 5 000 $ for the first offence, and to a fine of not less than 1 000 $ and not more than 10 000 $ for any subsequent offence, or in any such case, to imprisonment for not more than two months or to both such imprisonment and fine.

A corporation contravening section 29 or 31 is liable to a fine of not less than 1 000 $ and not more than 10 000 $ for the first offence, and to a fine of not less that 3 000 $ and not more than 60 000 $ for any subsequent offence.

96.5 A natural person contravening subparagraph a of section 91 or section 91.1 or contravening an order respecting sulfur dioxide discharges by a copper smelting plant is liable to a fine or not less than 5 000 $ and not more than 10 000 $ for the first offence, and to a fine of not less than 10 000 $ and not more than 25 000 $ for any subsequent offence, or in any such case, to imprisonment for not more than six months or to both such imprisonment and fine.

A corporation contravening subparagraph a of section 91 or section 91.1 or contravening an order respecting sulfur dioxide discharges from a copper smelting plant, is liable to a fine of not less than 10 000 $ and not more than 50 000 $ for a first offence, and to a fine of not less than 25 000 $ and not more than 100 000 $ for any subsequent offence.

96.6 A natural person contravening section 96.2 of this Regulation, paragraph b of section 50 of the Act or paragraph b of section 51 of the Act with respect to a device limiting the discharge of a contaminant covered by section 96.1 of this Regulation is liable to a fine of not less than 100 $ and not more than 300 $ for the first offence, and to a fine of not less than 200 $ and not more than 1 000 $ for any subsequent offence, or in any such case, to imprisonment for not more than one month or to both such imprisonment and fine.

A corporation contravening section 96.2 of this Regulation, paragraph b of section 50 of the Act or paragraph b of section 51 of the Act with respect to a device limiting the discharge of a contaminant covered by section 96.1 of this Regulation is liable to a fine of not less than 500 $ and not more than 10 000 $ for the first offence, and to a fine of not less than 2 000 $ and not more than 20 000 $ for any subsequent offence.

ALABAMA

b. a petition to shutdown an afterburner is submitted in writing to the Director thirty (30) days prior to the shutdown date each season specifying the period(s) within the seasonal afterburner shutdown period when the shutdown shall be in effect for the afterburner;

c. written approval is granted by the Director for each afterburner; and

d. monthly records in a format approved by this Department, are maintained during the periods of afterburner shutdown of the quantity of VOC emissions from the source for which the afterburner is normally used as an air pollution control device.

Chapter 335-3-7
Carbon Monoxide Emissions

335-3-7-.01 Metals Production.

No person shall emit the carbon monoxide gases generated during the operation of a grey iron cupola, blast furnace, or basic oxygen steel furnace unless they are burned at 1300°F for 0.3 seconds or greater in a direct flame afterburner or equivalent device equipped with an indicating pyrometer which is positioned in the working area at the operator's eye level.

335-3-7-.02 Petroleum Processes.

No person shall emit carbon monoxide waste gas stream from any catalyst regeneration of a petroleum cracking system, petroleum fluid coker, or other petroleum process into the atmosphere, unless the waste gas stream is burned at 1300°F for 0.3 seconds or greater in a direct-flame afterburner or boiler equipped with an indicating pyrometer which is positioned in the working area at the operator's eye level.

Chapter 335-3-8
Nitrogen Oxides Emissions

335-3-8-.01 New Combustion Sources.

(1) No person shall cause or permit emissions of nitrogen oxides from a new gas-fired boiler with a capacity of 250 million BTU/hr or more in excess of 0.20 pounds per million BTU of heat input per hour.

(2) No person shall cause or permit emissions of nitrogen oxides from a new oil-fired boiler with a capacity of 250 million BTU/hr or more in excess of 0.30 pounds per million BTU of heat input per hour.

(3) No person shall cause or permit emission of nitrogen oxides from a new coal-fired boiler with a capacity of 250 million BTU per hour or more in excess of 0.7 pounds per million BTU of heat input per hour.

(4) For purposes of this Rule the total heat input from all similar fuel combustion units at a plant or premises shall be used for determining the maximum allowable emission of nitrogen oxides that passes through a stack or stacks.

335-3-8-.02 Nitric Acid Manufacturing.

(1) Except as provided in Section 335-3-8-.02(2), no person shall cause or permit the emission of nitrogen oxides, calculated as nitrogen dioxide, from nitric acid manufacturing plants in excess of 5.5 pounds per ton of one hundred percent (100%) acid produced.

(2) For nitric acid manufacturing plants within a designed capacity greater than one hundred and fifty (150) tons per day of one hundred percent (100%) acid, no person shall cause or permit the emission of nitrogen oxides, calculated as nitrogen dioxide, from such manufacturing plants in excess of twenty (20) pounds per ton of one hundred percent (100%) acid produced.

Chapter 335-3-9
Control of Emissions from Motor Vehicles

335-3-9-.01 Visible Emission Restrictions for Motor Vehicles.

(1) No persons shall cause or permit the emission of visible air contaminants from gasoline-powered motor vehicles, operated upon any street, highway, or other public place, for longer than five (5) consecutive seconds.

(2) No person shall cause or permit the emission of visible air contaminants from diesel-powered motor vehicles and other movable sources of a shade or density greater than twenty percent (20%) opacity for longer than five (5) consecutive seconds.

(3) Uncombined Water. Where the presence of uncombined water is the only reason for failure of an emission to meet the requirements of this Rule such section shall not apply.

335-3-9-.02 Ignition System and Engine Speed.

All 1968 and subsequent model year gasoline powered motor vehicles shall be maintained so as to be in compliance with the following requirements:

(1) The number of revolutions per minute of an engine while operating at idle speed shall be in accordance with the specifications, and determined under conditions published by the manufacturer, but in no case shall the idle speed be less than the minimum specified in such published specifications. Revolutions per minute shall be tested for accuracy and precision at reasonable intervals.

(2) Ignition timing of an engine shall comply with the published specifications of the manufacturer as determined in accordance with procedures and conditions specified by the manufacturer.

(3) All cylinders shall be firing.

335-3-9-.03 Crankcase Ventilation Systems.

The positive crankcase ventilation on all 1968 and subsequent model year gasoline-powered motor vehicles, except motorcycles and motor tricycles, and all 1969 and subsequent model year gasoline-powered motor vehicles, including motorcycles and motor tricycles, shall meet the following requirements:

(1) The plumbing and connections shall be properly connected as installed by the manufacturer and free of obstructions and leakage.

(2) There shall be a negative pressure (suction) at the inlet of the crackcase ventilation valve.

(3) The crackcase ventilation valve shall be freely operative so as to regulate the flow of gases through the system.

335-3-9-.04 Exhaust Emission Control Systems.

(1) Air Injection System. Exhaust emission control air injection systems on those gasoline-powered motor vehicles so equipped by the manufacturer shall operate so that:

(a) The air delivery hoses, connections, and air distribution manifold shall be properly connected as installed by the manufacturer and free of obstructions and leakage.

(b) The air compressor drive belt tension shall be within manufacturer's specifications.

(c) There is a positive air flow from the air pump to the air delivery distribution manifold.

(d) The check valve prevents any reverse air flow from the air distribution manifold out through the check valve inlet.

(e) The anti-backfire valve, gulp-valve, air bypass valve, or other similar device with the same function permits the passage of air from the air jump to the exhaust manifold or manifolds, except when the carburetor throttle is closed rapidly from an open position as in deceleration.

(2) Engine Modification Systems. All vacuum control valves, vacuum lines, mechanical linkage, electrical circuits and switches peculiar to certain engine modification systems shall be properly connected as installed on all 1968 and subsequent model year gasoline-powered motor vehicles so equipped by the manufacturer.

(3) Other Exhaust Emission Control Systems. Any other exhaust emission control system, other than air injection or engine modification which is installed or incorporated in a motor vehicle in compliance with Federal motor vehicle pollution control regulations shall be maintained in good operable conditions as specified by the manufacturer and shall be used at all times that the motor vehicle is operated.

(4) The requirements of this Part shall apply to all gasoline-powered motor vehicles with the following exceptions:

(a) Vehicles of 1967 or earlier model year.

(b) Vehicles not equipped by the manufacturer with exhaust emission control injection systems.

(c) Motor vehicles with an engine displacement of less than 50 cubic inches (819.35 cubic centimeters).

335-3-9-.05 Evaporative Loss Control Systems.

The evaporative loss control systems or devices designed and installed on 1972 and subsequent model year gasoline-powered motor vehicles shall be maintained in an operable condition such that the system or device continues to reduce or prevent the emission to the atmosphere of the vapors of the hydrocarbon fuel contained in the fuel tank, carburetor and/or fuel pump of the motor vehicle.

335-3-9-.06 Other Prohibited Acts.

In addition to the other strictures contained in this Chapter, no person shall cause, suffer, allow, or permit the removal, disconnection, and/or disabling of a positive crankcase ventilator, exhaust emission control system, or evaporative loss control system which has been installed on a motor vehicle; nor shall any person defeat the design purpose of any such motor vehicle pollution control device by installing therein or thereto any part or component which is not a comparable replacement part or component of the device. Provided that:

(1) The components or parts of emission control systems on motor vehicles may be disassembled or reassembled for the purpose of repair and maintenance in proper working order.

(2) Components and parts of emission control systems may be removed and replaced with like components and parts intended by the manufacturer for such replacement.

(3) The provisions of this Rule shall not apply to salvage operations on wrecked motor vehicles when the engine is so damaged that it will not be used again for the purpose of powering a motor vehicle on a highway.

335-3-9-.07 Effective Date.

The provisions of this Chapter shall become effective sixty (60) days from the date of its adoption and promulgation.

Chapter 335-3-10
Standards of Performance for New Stationary Sources

335-3-10-.01 General.

(1) The Environmental Protection Agency Regulations, and the Appendices applicable thereto, governing Standards of Performance for New Stationary Sources (40 CFR 60 and Appendices) designated in Rules 335-3-10-.02 and 03 are incorporated by reference as they exist in 40 CFR 60 (1987) and 52 FR 30674 (August 17, 1987), 52 FR 34639 (September 14, 1987), 52 FR 34868 (September 15, 1987), 52 FR 36408 (September 29, 1987), 52 FR 41423 (October 28, 1987), 52 FR 42434 (November 5, 1987), and 52 FR 47826 (December 16, 1987) as amended by the word or phrase substitutions given in Rule 335-3-10-.04. References for specific documents containing the complete text of subject regulations are given in Appendix C to these Regulations. The materials incorporated by reference are available for purchase (at 30 cents a page) and inspection at the Department's offices at 1751 Cong. W. L. Dickinson Drive, Montgomery, Alabama 36109.

(2) Chapters 3, 4, 5, 6, 7, and 8 shall not apply to source categories subject to this Chapter for the specific pollutants to which a standard under this Chapter applies.

(3) Definitions. For purposes of this Chapter, the definitions listed in 40 CFR 60.2 will apply.

335-3-10-.02 Designated Standards of Performance.

(1) Subpart D — Fossil Fuel-Fired Steam Generators for which construction is commenced after August 17, 1971.

(a) Subpart Da — Electric Utility Steam Generating Units for which construction is commenced after September 18, 1978.

(b) Subpart Db — Industrial-Commercial-Institutional Steam Generating Units.

(2) Reserved.

(3) Subpart E — Incinerators.

(4) Subpart F — Portland Cement Plants.

(5) Subpart G — Nitric Acid Plants.

(6) Subpart H — Sulfuric Acid Plants.

(7) Subpart I — Hot Mix Asphalt Facilities.

(8) Subpart J — Petroleum Refineries.

(9) Subpart K — Storage Vessels for Petroleum Liquids constructed after June 11, 1973 and prior to May 19, 1978.

(a) Subpart Ka — Storage Vessels for Petroleum Liquids constructed after May 18, 1978.

(b) Subpart Kb — Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 12, 1984.

(10) Reserved.

(11) Reserved.

(12) Subpart L — Secondary Lead Smelters.

(13) Subpart M — Secondary Brass and Bronze Ingot Production Plants.

(14) Subpart N — Iron and Steel Plants.

(a) Subpart Na — Standards of Performance for Secondary Emissions from Basic Oxygen Process Steelmaking Facilities for which construction is commenced after Janaury 20, 1983.

ALASKA

(A) coal, and in operation before July 1, 1972;

(B) coal, and rated less than 250 million Btu per hour heat input; or

(C) municipal wastes;

(3) 0.1 grains for an industrial process in operation before July 1, 1972;

(4) 0.15 grains for fuel burning equipment in operation before November 1, 1982, and using more than 20 percent woodwaste as fuel; or

(5) 0.04 grams for an asphalt plant constructed or modified after June 11, 1973;

(c) Sulfur-compound emissions, expressed as sulfur dioxide, from an industrial process or from fuel burning equipment may not exceed 500 ppm averaged over a period of three hours, except as provided in (d) of this section, and 18 AAC 50.060.

(d) Emissions from a source installed or modified after November 1, 1982 may not exceed

(1) repealed 6-2-88;

(2) at a petroleum refinery

(A) catalytic cracking unit catalyst regenerator

(i) 1.0 kilogram of particulate matter per 1,000 kilograms of coke burnoff;

(ii) 43.0 additional grams of particulate matter per million joules supplemental heat attributable to fuels burned in a catalyst regenerator waste heat boiler; and

(iii) 500 ppm carbon monoxide by volume of exhaust gas;

(B) sulfur recovery plant rated at more than 20 long tons per day

(i) 250 ppm sulfur dioxide at zero percent oxygen on a dry basis; or

(ii) 10 ppm hydrogen sulfide and a total of 300 ppm reduced sulfur compounds, expressed as sulfur dioxide, at zero percent oxygen on a dry basis, if the air contaminants are not oxidized before release to the atmosphere; and

(C) fuel burning equipment, sulfur dioxide averaged over three hours

(i) equal to the concentration of uncontrolled emissions which would result from burning fuel gas containing 230 milligrams hydrogen sulfide per dry standard cubic meter, from equipment burning fuel gas;

(ii) a calculated concentration based on the allowable emissions in (i) and (iii) of this subparagraph and the proportion of fuel gas and other fuels to the total fuel burned in fuel burning equipment; or

(iii) 500 ppm from all other fuel burning equipment;

(3) at a coal preparation facility

(A) thermal drying unit, 70 milligrams of particulate matter per cubic meter of exhaust gas at standard conditions; and

(B) pneumatic coal cleaning unit, 40 milligrams of particulate matter per cubic meter of exhaust gas at standard conditions; and

(4) at a portland cement plant

(A) clinker cooler, 0.050 kilograms of particulate matter per 1000 kilograms of feed on a dry basis to the kiln; and

(B) kiln, 0.15 kilograms of particulate matter per 1000 kilograms of feed on a dry basis.

(e) Release of materials other than process emissions, products of combustion, or materials introduced to control pollutant emissions from a stack at a source built or modified after November 1, 1982 is prohibited unless approved in writing by the department.

(f) No person may cause or permit bulk materials to be handled, transported, or stored, or engage in an industrial activity or construction project without taking reasonable precautions to prevent particulate matter from becoming airborne.

50.060. PULP MILLS. Average emissions per ton of pulp produced from a sulfite pulp mill may not exceed in any 24-hour period

(1) 20 pounds of sulfur oxides (expressed as sulfur dioxide) from blow pits, washer vents, storage tanks, digester relief systems, and recovery systems; and

(2) two pounds of particulate matter from blow pits, washer vents, storage tanks, digester relief systems, and recovery systems.

50.070. MOTOR VEHICLE EMISSIONS. (a) Emissions from gasoline-powered motor vehicles, excluding condensed water vapor, may not be visible for more than any five consecutive seconds.

(b) Visible emissions from diesel-powered motor vehicles, excluding condensed water vapor, may not result in a reduction of visibility of greater than 40 percent through the exhaust effluent for more than any five consecutive seconds.

50.080. [Repealed]

50.085. WOOD-FIRED HEATING DEVICES. For wood-fired heating devices,

(1) when an air quality alert is issued under 18 AAC 50.610(a)(1)(B) for particulate matter within a specific area, except areas set out in (3) of this section, visible emissions at the point of release to the atmosphere may not reduce visibility through the exhaust effluent by 50 percent or greater for more than 15 minutes in any one hour;

(2) burning in a way that creates black smoke is prohibited; and

(3) for wood smoke control areas identified in 18 AAC 50.021(d)

(A) visible emissions at the point of release to the atmosphere may not reduce visibility through the exhaust effluent by 50 percent or greater for more than 15 minutes in any one hour; and

(B) when an air emergency has been issued under 18 AAC 50.610 (a)(3)(D), no person may operate, permit, or allow the operation of a wood-fired heating device which results in the emission of smoke.

50.090. ICE FOG LIMITATIONS. The department will, in its discretion, require any person proposing to build or operate an industrial process, fuel burning equipment or incinerator in areas of potential ice fog, to obtain a permit to operate and to reduce water emissions.

50.100. MARINE VESSELS. Within three miles of the coastline of Alaska, visible emissions from any marine vessel, excluding condensed water vapor, may not result in a reduction of visibility through the exhaust effluent of greater than

(1) 40 percent for a period or periods aggregating more than three minutes in any one hour, except as provided in (2) of this section; and

(2) 40 percent for a period or periods aggregating more than six minutes in any one hour during initial startup of diesel-driven vessels.

50.110. AIR POLLUTION PROHIBITED. No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.

ARIZONA

§49-502. Violation; classification

Any person who violates any provision of this article or any rule or regulation adopted pursuant to this article or any effective order of abatement issued pursuant to this article is guilty of a petty offense for each day the violation continues unless another classification is specifically prescribed in this article. Each day of violation shall constitute a separate offense. Peace officers and the control officer and his deputies shall have the authority to issue a notice to appear under the same conditions and procedures set forth in section 13-3903 for a violation of any provision of this article or any rule or regulation adopted pursuant to this article or any effective order of abatement issued pursuant to this article.

§ 49-503. Defenses

Violations under section 49-502 shall be malum prohibitum. Lack of criminal intent shall not constitute a defense to such violations.

§ 49-504. Limitations

Nothing in this article shall be construed so as to:

1. Grant any jurisdiction or authority with respect to air contamination or pollution existing solely within commercial and industrial plants, works, or shops owned by or under control of the person causing the air contamination or pollution.

2. Alter or in any other way affect the relations between employers and employees with respect to or concerning any condition of air contamination or pollution.

3. Require the readoption of any rule or regulation previously adopted prior to the effective date of this article, provided such rule or regulation is in conformity with the provisions of this article.

4. Prevent the normal farm cultural practices which cause dust.

§49-505. Preservation of rights

It is the purpose of this article to provide additional and cumulative remedies to prevent, abate, and control air pollution in the state. Nothing contained in this article shall be construed to abridge or alter rights of action or remedies in equity under the common law or statutory law, criminal or civil, nor shall any provisions of this article, or any act done by virtue thereof, be construed as estopping the state or any municipality, or owners of land from the exercise of their rights in equity or under the common law or statutory law to suppress nuisances or to abate pollution.

§49-506. Voluntary no-drive days

A county with a population of four hundred thousand or more persons shall implement a voluntary program to encourage all drivers within such a county to not drive their motor vehicles during certain prescribed days during the months of October through March 31 of each year.

Article 4 — Motor Vehicle Emissions Inspection

§49-521. Definition

In this article, unless the context otherwise requires, the term "motor vehicle" means a self-propelled vehicle weighing less than six thousand pounds that is designed for carrying persons [illegible] property, on a street or highway.

§49-522. Inspection facilities; location; operation; additional inspections and assistance; definition

A. The department environmental quality of shall:

1. Establish and operate, or contract for the establishment of and operation of, a prototype inspection facility in Maricopa county for inspection of motor vehicle emissions. Such facility shall include an engineering and testing laboratory. The department may contract for the establishment and operation of such facility with any person or company knowledgeable in the field of motor vehicle emissions testing if such contract can be performed at a cost less than the cost of the department's establishment and operation of such facility.

2. Establish and operate, or contract for the establishment and operation of, a prototype inspection facility in Pima county for inspection of motor vehicle emissions. The department may contract for the establishment and operation of such facility with any person or company knowledgeable in the field of motor vehicle emissions testing if such contract can be performed at a cost less than the cost of the department's establishment and operation of such facility.

B. All state, county, city, town and school district motor vehicles operated in Maricopa and Pima counties shall be inspected for emissions control as soon as practicable after the respective county inspection facilities become operational. The department of environmental quality, in cooperation with the various agencies, shall schedule the inspection of such vehicles in such a manner as shall least disrupt service to the public. All such vehicles failing to meet standards shall be adjusted or repaired, to bring such vehicles into compliance with the standards established pursuant to sections 49–447 and 28–955 and shall be reinspected within thirty days. Such adjustments and repairs shall be done by the agency owning the vehicle, except that minor adjustments may be made, without charge, by personnel at such inspection facility.

C. Any county, city, town or school district operating a fleet of one hundred or more motor vehicles may, at its own expense, establish and operate a self-inspection program and facilties, providing standards are comparable to section 49-447 or at their own option, higher than those applied by the department of environmental quality in the inspection of the motor vehicles of any unit of government. Units of government may contract for such inspection as authorized by title 11, chapter 7, article 3.

D. Such inspection facilities may also conduct, on a voluntary basis, emission inspections of privately owned motor vehicles, and with the permission of the owner, make minor adjustments to such vehicles to bring them into compliance with the standards established pursuant to sections 49-447 and 28-955. If more than minor adjustment is required, facility personnel shall make recommendations for necessary repairs to the owner of such vehicle.

E. The department of environmental quality may, through use of mobile inspection facilities, arrange for emissions inspections of state and political subdivision motor vehicles located outside or inside Maricopa and Pima counties.

F. The department of environmental quality may assist owners, upon their request, of fleets of three hundred or more motor vehicles in setting up self-inspection programs for such vehicles. All costs of such self-inspection programs shall be at the sole expense of such fleet owner.

§49-523. Vehicle inspection fund; composition; authorized expenditures; exemptions

A. There is established a vehicle inspection fund which shall consist of:

1. Money appropriated thereto by the legislature.

2. Money received from private grants or donations when so designated by grantor or donor.

3. Money received from the United States by grant or otherwise to assist the state in any vehicle inspection program.

B. No monies in the vehicle inspection fund shall be expended or disbursed except for the purposes of:

1. Purchasing an interest in lands, buildings, fixtures and equipment for inspection facilities.

2. Receiving, matching and expending funds from the United States.

3. Operation of inspection facilities, including staff and training of staff personnel for such facilities.

4. Payment of contractual fees for the establishment and operation of facilities to carry out the provisions of this article.

C. The director of the department of administration shall approve properly certified claims submitted by the department of environmental quality for reimbursement of expenditures in the administration or enforcement of the provisions of this article. When such claims for reimbursement are approved by the director of the department of administration and transmitted to the state treasurer, he shall transfer the amounts claimed to the department of environmental quality.

D. No monies in the vehicle inspection fund shall revert to the general fund, and such monies shall be exempt from the provisions of section 35-190, relating to lapsing of appropriations.

Article 5 — Annual Emissions Inspection of Motor Vehicles

[*Editor's note:* The December 31, 1990, expiration date for this Article was repealed by Chapter 225, §9, Laws of 1989. Section 10 of chapter 225 provides for repeal of this Article on January 1, 1999.]

§49-541. Definitions

In this article, unless the context otherwise requires:

1. "Certificate of inspection" means a serially numbered device or symbol, as may be prescribed by the director, indicating that a vehicle has been inspected pursuant to the provisions of §49-546 and has passed inspection.

2. "Certificate of waiver" means a serially numbered device or symbol, as may be prescribed by the director, indicating that the requirement of passing reinspection has been waived for a vehicle pursuant to the provisions of this article.

3. "Conditioning mode" means either a fast idle test condition or a loaded test condition.

4. "Curb idle test condition" means an exhaust emissions test conducted with the engine of a vehicle running at the manufacturer's specified idle speed, plus or minus one hundred revolutions per minute, but without pressure exerted on the accelerator.

5. "Department" means the department of environmental quality.

6. "Director" means the director of environmental quality.

7. "Emissions inspection station permit" means a certificate issued by the director authorizing the holder to perform vehicular inspections pursuant to this article.

8. "Fast idle test condition" means an exhaust emissions test conducted with the engine of the vehicle running under an accelerated condition to an extent prescribed by the director

9. "Fleet emissions inspection station" means any inspection facility operated under a permit issued to a qualified fleet owner or lessee as determined by the director.

10. "Golf cart" means a motor vehicle which has not less than three wheels in contact with the ground, has an unladen weight less than thirteen hundred pounds, is designed to be and is operated at not more than fifteen miles an hour and is designed to carry golf equipment and persons.

11. "Gross weight" has the meaning prescribed in section 28-206.

12. "Independent contractor" means any person, business firm, partnership or corporation with whom the director may enter into an agreement providing for the construction, equipment, maintenance, personnel, management and operation of official emissions inspection stations pursuant to §49-545.

13. "Loaded test condition" means any exhaust emissions test conducted at cruise conditions as prescribed by the director.

14. "Nonattainment areas" means areas which have been designated by the administrator of the Environmental Protection Agency, acting pursuant to section 107 of the Clean Air Act, 42 United States Code section 7401 et seq., as exceeding national primary or secondary ambient air standards for the pollutant of carbon monoxide or ozone and designated as such in the state implementation plan submitted to the Environmental Protection Agency, except that nonattainment area does not include the one thousand two hundred eighty-eight square mile area which the Environmental Protection Agency determined should be redesignated as an attainment area as printed in the Federal Register, Volume 48, Number 216, Monday, November 7, 1983, page 51161.

15. "Official emissions inspection station" means an inspection facility, other than a fleet emissions inspection station, whether placed in a permanent structure or in a mobile unit for conveyance among various locations within this state, for the purpose of conducting emission inspections of all vehicles required to be inspected pursuant to this article.

16. "Tampering" means removing, defeating or altering an emission control device which was installed at the time a vehicle was manufactured.

17. "Vehicle" means any automobile, truck, truck tractor, motor bus of self-propelled or motor-driven vehicle registered or to be registered in this state and used upon the public highways of this state for the purpose of transporting persons or property, except implements of husbandry, raodrollers or road machinery temporarily operated upon the highway.

§49-542. Annual emissions inspection program; powers and duties of the director; administration; periodic inspection; minimum standards and rules; limitation on repair costs; exception.

[Effective from and after December 31, 1988]

A. The director shall administer a comprehensive annual emissions inspection program which shall require the inspection of vehicles in this state pursuant to this article and applicable administrative rules. Such inspection is required in counties with a population in excess of three hundred fifty thousand persons only in nonattainment areas of the county. for those vehicles owned by a person who is subject to section 15-1444 or 15-1627 and for those vehicles registered outside of a nonattainment area but used to commute to the driver's principal place of employment located within a nonattainment area. Inspection in other counties of the state shall commence upon application by a county board of supervisors for participation in such inspection program, subject to approval by the director. In all counties with a population of three hundred fifty thousand or fewer persons, the director shall as conditions dictate provide for testing to determine the effect of vehicle related pollution on ambient air quality in all communities with a metropolitan area population of twenty thousand persons or more. If such testing detects the violation of state ambient air quality standards by vehicle related pollution, the director shall forward a full report of such violation to the president of the senate, the speaker of the house of representatives and the governor.

B. The state's annual emissions inspection program shall provide for vehicle inspections at official emissions inspection stations or at fleet emissions inspection stations. The director may enter into agreements with the department of transportation or with county assessors for the use of official emissions inspection stations for the purpose of conducting vehicle registrations. An official or fleet emissions inspection station permit shall not be sold, assigned, transferred, conveyed or removed to another location except on such terms and conditions as the director may prescribe.

C. Vehicles required to be inspected and registered in this state, except those provided for in section 49-546, shall be inspected, for the purpose of complying with the registration or reregistration requirement pursuant to subsection D of this section, in accordance with the provisions of this article no more than ninety days prior to each reregistration expiration date. A vehicle may be submitted voluntarily for inspection more than ninety days before the reregistration expiration date on payment of the prescribed inspection fee. Such voluntary inspection shall not be considered as compliance with the registration or reregistration requirement pursuant to subsection D of this section.

D. A vehicle shall not be registered or reregistered until such vehicle has passed the emissions inspection and the tampering inspection prescribed in subsection F of this section or has been issued a certificate of waiver. If any vehicle to be registered or reregistered is being sold by a dealer licensed to sell motor vehicles pursuant to title 28, the cost of any inspection and any repairs necessary to pass the inspection shall be borne by the dealer. A dealer licensed to sell motor vehicles pursuant to title 28 whose place of business is located in a nonattainment area shall not deliver any vehicle to the retail purchaser until the vehicle passes any inspection required by this article or the vehicle is exempt under subsection H of this section.

E. On the registration or reregistration of a vehicle which has complied with the minimum emissions standards pursuant to this section or is otherwise exempt under this section, the registering officer shall issue an air quality compliance sticker to the registered owner which shall be placed on the vehicle as prescribed by rule adopted by the Department of Transportation or issue a modified year validating tab as prescribed by rule adopted by the Department of Transportation. Those persons who reside outside of a nonattainment area but who elect to test their vehicle or are required to test their vehicle pursuant to this section and who comply with the minimum emissions standards pursuant to this section or are otherwise exempt under this section shall remit a compliance form, as prescribed by the Department of Transportation, and proof of compliance issued at an official emissions inspection station to the Department of Transportation along with the appropriate fees. The Department of Transportation shall then issue the person an air quality compliance sticker which shall be placed on the vehicle as prescribed by rule adopted by the Department of Transportation. The registering officer or the Department of Transportation shall collect an air quality compliance fee of twenty-five cents. The registering officer or the Department of Transportation shall forward the air quality compliance fee to the state treasurer who shall deposit the monies in the special fund established pursuant to section 28-301.03. The Department of Transportation shall forward any emissions inspection fee to the state treasurer who shall deposit the monies in the emissions inspection fund. The provisions of this subsection do not apply to those vehicles registered pursuant to Title 28, Chapter 2, Article 1.1, the sale of vehicles between motor vehicle dealers or vehicles leased to a person residing outside of a nonattainment area by a leasing company whose place of business is in a nonattainment area.

F The director shall adopt minimum emissions standards pursuant to section 49-447 with which the various classes of vehicles shall be required to comply. For the purposes of determining compliance with minimum emissions standards:

1. A motor vehicle manufactured in or before the 1980 model year shall be required to take a pass only the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition. The conditioning mode shall, at the option of the vehicle owner or owner's agent, be administered only after the vehicle has failed the curb idle test condition. Upon completion of such conditioning mode, a vehicle that has failed the curb idle test condition may be retested in the curb idle test condition. If the vehicle passes such retest, it shall be deemed in compliance with minimum emissions standards unless the vehicle fails the tampering inspection pursuant to subsection G of this section.

2. A motor vehicle manufactured in or after the 1981 model year shall be required to take and pass the curb idle test condition and the loaded test condition, except that a motorcycle or a constant four-wheel drive vehicle is required only to take and pass the curb idle test condition. If the vehicle passes, it is deemed in compliance with minimum emissions standards unless the vehicle fails the tampering inspection pursuant to subsection G of this section.

3. Fleet operators which have been issued a permit under section 49-546 are required to test their vehicles as follows:

(a) A motor vehicle manufactured in or before the 1980 model year shall take and pass only the curb idle test condition, except that a diesel powered vehicle is subject to only a loaded test condition.

(b) A motor vehicle manufactured in or after the 1981 model year shall take and pass the curb idle test condition and a twenty—five hundred revolutions per minute unloaded test condition. Motor vehicles failing the initial or subsequent test are not subject to a penalty fee for late registration renewal if the original testing was accomplished prior to the expiration date and if the registration renewal is received by the motor vehicle division or the county assessor within thirty days of the original test.

G. In addition to an emissions inspection, a vehicle is subject to a tampering inspection on at least a biennial basis if the vehicle was manufactured after the 1974 model year. The director shall adopt vehicle configuration guidelines for the tampering inspection which shall be an examination to determine the presence of an operational air pump and, on a vehicle originally manufactured with a catalytic converter, an examination consisting of:

1. A visual check to determine the presence of properly installed catalytic converters.

2. The use of test paper to determine the presence of lead in the vehicle exhaust.

3. A visual inspection for the presence or malfunction of the fuel filler neck inlet restrictor.

H. The director may adopt rules for purposes of implementation, administration, regulation and enforcement of the provisions of this article including:

1. The submission of records relating to the emissions inspection of vehicles inspected by another jurisdiction in accordance with another inspection law and the acceptance of such inspection for compliance with the provisions of this article.

2. The exemption from inspection of:

(a) A motor vehicle manufactured in or before the 1966 model year.

(b) New vehicles originally registered at the time of initial retail sale and titling in this state pursuant to §28-302.

(c) Vehicles registered pursuant to title 28, chapter 2, article 1.1.

(d) Vehicles which will not be available within the state during the ninety days prior to registration.

(e) Golf carts.

(f) Electrically-powered vehicles.

(g) Vehicles with an engine displacement of less than ninety cubic centimeters.

(h) The sale of vehicles between motor vehicle dealers.

(i) Vehicles leased to a person residing outside of a nonattainment area by a leasing company whose place of business is in a nonattainment area.

3. The inspection of governmental entities' vehicles in accordance with the standards adopted by the director although such vehicles may not be required to be registered in this state.

4. Compiling and maintaining records of emissions test results after servicing.

5. A procedure which shall allow the vehicle service and repair industry to compare the calibration accuracy of its emissions testing equipment with the department's calibration standards.

6. Training requirements for automotive repair personnel using emissions measuring equipment whose calibration accuracy has been compared with the department's calibration standards.

7. Any other rule which may be required to accomplish the provisions of this article.

I. The director shall, after consultation with automobile manufacturers and the vehicle service and repair industry, establish by rule a definition of "low emissions tune-up" for motor vehicles subject to inspection under this article. The definition shall specify repair procedures which, when implemented, will reduce vehicle emissions.

J. The director shall adopt rules which specify that the estimated retail cost of all recommended maintenance and repairs shall not exceed the amounts prescribed in this subsection, except that if a vehicle fails a tampering inspection there is no limit on the cost of recommended maintenance and repairs. The director shall issue a certificate of waiver for a vehicle which has failed reinspection, if the director has determined that all recommended maintenance and repairs have been performed. If, after reinspection, the director has determined that the vehicle is in compliance with minimum emissions standards or that all recommended maintenance and repairs for compliance with minimum emissions standards have been performed, but that tampering discovered at a tampering inspection has not been repaired, the director may issue a certificate of waiver if the owner of the vehicle provides to the director a written statement from an automobile parts or repair business that an emissions control device which is necessary to repair the tampering is not available and cannot be obtained from any usual source of supply before the vehicle's current registration expires. Rules adopted by the director for the purpose of establishing the estimated retail cost of all recommended maintenance and repairs pursuant to this subsection shall specify that such cost shall not exceed:

1. Three hundred dollars for a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds.

2. Three hundred dollars for a diesel powered vehicle with tandem axles.

3. For a vehicle other than a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds and other than a diesel powered vehicle with tandem axles:

(a) Fifty dollars for such a vehicle manufactured in or before the 1974 model year.

(b) Two hundred dollars for such a vehicle manufactured in 1975 through 1979 model years.

(c) Three hundred dollars for such a vehicle manufactured in or after the 1980 model year.

K. Each person whose vehicle has failed an emissions inspection shall be provided a list of those general recommended tune-up procedures for vehicles which are designed to reduce vehicle emissions levels.

L. Notwithstanding any other provisions of this article, the director may adopt rules allowing exemptions for the requirement that all vehicles must meet the minimum standards for registration or reregistration.

M. The director of environmental quality shall establish, in cooperation with the assistant director for the motor vehicle division of the department of transportation, an adequate method for identifying bona fide residents residing outside of nonattainment areas to ensure that such residents are exempt from compliance with the inspection program established by this article and rules adopted under this article.

[*Editor's note:* Section 9 of Chapter 319, laws of 1986, provides:

"Sec. 9 Authority to provide tampering inspection on annual basis

Notwithstanding the provisions of section 36-1772, [renumbered as 49-542] Arizona Revised Statutes, the director of the department of health services, in order to ensure that the anticipated results of the tampering inspection program are realized and to avoid uneven work loads in the tampering inspections, may provide for tampering inspections for certain vehicles as frequently as on an annual basis."]

§49-543. Emissions inspection costs; disposition; fleet inspection; certificates

A. The director shall fix, regulate and alter in accordance with this section the fees required to be paid for the inspection of every vehicle inspected pursuant to this article.

[*Editor's Note*: The following version of subsection B. expires December 31, 1990.]

B. The director shall fix the fees, not to exceed seven dollars fifty cents per inspection, except that the director may fix a fee for emission inspection of a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds or for the emissions inspection of a diesel powered vehicle with tandem axles at more than seven dollars fifty cents but not more than twenty-five dollars per inspection. Such fees shall be fixed by the director and shall not exceed the contractual charge payable to any independent contractor. The costs to the state of administering the emission inspection services performed by the independent contractor shall be provided by appropriation from the state general fund.

[*Editor's note:* From and after January 1, 1991, the text of subsection B. is amended by Chapter 225, laws of 1989, to read as follows:]

B. The director shall fix the fees, not to exceed ten dollars per inspection, except that the director may fix a fee for the emissions inspection of a diesel powered vehicle with a gross weight in excess of twenty-six thousand pounds or for the emissions inspection of a diesel powered vehicle with tandem axles at more than ten dollars but not more than twenty-five dollars per inspection. Such fees shall be fixed by the director and shall not exceed the contractual charge payable to any independent contractor. The costs to the state of administering the emissions inspection services performed by the independent contractor shall be provided by appropriation from the state general fund.

C. The fees charged for official emissions inspection shall be uniform as applied to each class of vehicle which shall be defined by the director. Except for fees collected by the director pursuant to §49-546, the inspection fees required to be paid pursuant to this article may be collected with the registration fee by the county assessor at the time and place of motor vehicle registration pursuant to title 28, chapter 3, article 1 and transferred to the state treasurer for deposit in the emissions inspection fund in accordance with the rules and regulations adopted by the director or may be collected by the independent contractor at the time of inspection by means of an approved check or cash.

D. Any person, except a person who has been issued a certificate of waiver pursuant to §49-542, subsection J, whose vehicle has been inspected at an official emissions inspection station shall, if such vehicle was not found to comply with the minimum standards, have his vehicle repaired, including recommended repair or replacement of emissions control devices as a result of tampering, and have the right within sixty consecutive calendar days but not thereafter to return such vehicle for one reinspection without charge. The department may provide for additional reinspections without charge. A vehicle shall not be deemed to pass a reinspection unless the tampering discovered during the tampering inspection is repaired with new or reconditioned emissions control devices.

E. The department shall issue certificates of inspection to owners of fleet emissions inspection stations. Each certificate shall be validated by the fleet emissions inspection stations in a manner required by the director at the time that each owner's fleet vehicle has been inspected or has passed inspection. The validated certificate of inspection shall indicate at the time of registration that the owner's fleet vehicle has been inspected and that the vehicle has passed inspection.

F. The director shall fix an emissions inspection fee before inspection certificates may be issued to the owner of any fleet emissions inspection station. Such fee shall be uniform for each inspection certificate issued and shall be based upon the director's estimated costs to the state of administering and enforcing the provisions of this article as they apply to fleet emissions inspection stations and the vehicles inspected therein. The director shall promptly transmit all such monies collected by him pursuant to this article to the state treasurer who shall deposit them in the emissions inspection fund.

G. The director may fix an administrative fee to cover the costs of issuing exemptions or certificates of waiver pursuant to §49-542 but such fee shall not exceed five dollars.

§49-544. Emissions inspection fund; composition; authorized expenditures; exemptions; investment

A., There is establish an emissions inspection fund which shall consist of:

1. Monies appropriated to the fund by the legislature.

2. All monies remitted by owners of vehicles which are collected for emissions inspection.

3. All monies collected by the director for the issuance of inspection certificates to owners of fleet emissions inspection stations.

4. Monies received from private grants or donations when so designated by the grantor or donor.

5. Monies received from the United States by grant or otherwise to assist the state in any emissions inspection program.

6. All monies collected pursuant to §49-543, subsection G.

B. The director of the department of administration shall approve properly certified claims submitted by the department of environmental quality for the payment of contractual charges to independent contractors and for enforcement of the provisions of this article related to fleet emissions inspections, exemptions and certificates of waiver. When such claims are approved by the director of the department of administration and transmitted to the state treasurer, he shall transfer the amounts claimed to the director of environmental quality.

C. No monies in the emissions inspection fund shall revert to the general fund or the department of environmental quality and such monies shall be exempt from the provision of §35-190, relating to lapsing of appropriations until January 1, 1991.

D. The state treasurer shall invest inactive monies in the emissions inspection fund pursuant to laws governing such deposits. All interest earned on emissions inspection fund monies shall be credited by the state treasurer to the emissions inspection fund.

§49-545. Agreement with independent contractor; qualifications of contractor; agreement provisions

A. The director is authorized to enter into an emissions inspection agreement with one or more independent contractors, subject to public bidding, to provide for the construction, equipment, establishment, maintenance and operation of any official emissions inspection stations in such numbers and locations as may be required to provide vehicle owners reasonably convenient access to inspection facilities for the purpose of obtaining compliance with this article and the rules adopted pursuant hereto. The agreement may provide that official inspection stations shall be placed in permanent or movable buildings at particular locations as well as in mobile units for conveyance from one preannounced particular location to another.

B. The director is prohibited from entering into an emissions inspection agreement with any independent contractor who:

1. Is engaged in the business of manufacturing, selling, maintaining or repairing vehicles, except that the independent contractor shall not be precluded from maintaining or repairing any vehicle owned or operated by the independent contractor.

2. Does not have the capability, resources or technical and management skill to adequately construct, equip, operate and maintain a sufficient number of official emissions inspection stations to meet the demand for inspection of every vehicle which is required to be submitted for insection pursuant to this article.

C. All persons employed by the independent contractor in the performance of an emissions inspection agreement are deemed to be employees of the independent contractor and not of this state. No employee of the independent contractor shall wear any badge, insignia, patch, emblem, device, word or series of words which would tend to indicate that such person is employed by this state. Employees of the independent contractor are specifically prohibited under this subsection from wearing the flag of this state, the words "state of Arizona", the words "official emission inspection program" or any similar emblem or phrase.

D. The emissions inspection agreement authorized by this section shall contain in addition to any other provisions, provisions relating to the following:

1. A contract term or duration of seven and one-half years with reasonable compensation to the contractor if the provisions of this article are repealed.

2. That nothing in the agreement or contract shall require the state to purchase any asset or assume any liability if such agreement or contract is not renewed.

3. The minimum requirements for adequate staff, equipment, management and hours and place of operation of official emissions inspection stations.

4. The submission of such reports and documentation concerning the operation of official emissions inspection stations as the director and the auditor general may require.

5. Surveillance by the department of environmental quality and the auditor general to ensure compliance with vehicular emissions standards, procedures, rules and laws.

6. The right of this state, upon providing reasonable notice to the independent contractor, to terminate the contract with the independent contractor and to assume operation of the vehicle emissions inspection program.

7. The right of this state upon termination of the term of the agreement or upon assumption of the operation of the program to have transferred and assigned to it for reasonable compensation any interest in land, buildings, improvements, equipment, parts, tools and services used by the independent contractors in their operation of the program.

8. The right of this state upon termination of the term of the agreement or assumption of the operation of the program to have transferred and assigned to it any contract rights, and related obligations, for land, buildings, improvements, equipment, parts, tools and services used by the independent contractors in their operation of the program.

9. The obligation of the independent contractors to provide in any agreement to be executed by them, and to maintain in any agreements previously executed by them, for land, buildings, improvements, equipment, parts, tools and services used in their operation of the program for the right of the independent contractors to assign to this state any of their rights and obligations under such contract.

10. The amounts of liquidated damages payable by this state to the independent contractor if the state exercises its right to terminate the contract at the conclusion of the first, second, third or fourth year of the contract pursuant to paragraph 6. The damages recoverable by the independent contractor if the state exercises its right to terminate the contract shall be limited to the liquidated damages specified in the contract.

11. Any other provision deemed necessary by the director for the administration or enforcement of the emissions inspection agreement.

E. In conjunction with the attorney general and the department of administration, the department of environmental quality shall establish bid specifications or contract terms for a contract with an independent contractor as provided in this section, review bids for award of a contract with the independent contractors and negotiate any terms of a contract with the independent contractors.

F. In evaluating bids for an emissions inspection agreement, no additional consideration shall be given to a bid soley on the basis of the type of conditioning mode proposed in the bid.

§49-546. Fleet emissions inspection stations; certificates of inspection; dealer's inventory; investigations; revocation or suspension of permit

A. Any registered owner or lessee of a fleet of at least twenty-five vehicles may apply to the director for a permit to establish a fleet emissions inspection station. The director shall not issue any fleet emissions inspection station permit until he has found that the applicant:

1. Maintains an established place of business for the repair and maintenance of the applicant's fleet of vehicles.

2. Has obtained approved machinery, tools and equipment to adequately conduct the required emissions inspections.

3. Employs properly trained and licensed personnel with which to perform the necessary labor.

4. Agrees to provide data as may be prescribed by the director.

B. Any operator of a fleet emissions inspection station under a valid permit shall, upon filing an application in the manner and form prescribed by the director and paying the prescribed fee, receive a sufficient number of certificates of inspection for each vehicle in the applicant's fleet. No certificate of inspection shall be issued to any fleet vehicle until it has been inspected and found to comply with applicable regulations. A certificate of inspection issued to a fleet vehicle is transferable to an auctioneer who intends to sell the vehicle and who is licensed as a used motor vehicle dealer. The certificate of inspection is valid for a period of not to exceed one hundred eighty days after the transfer unless the vehicle is registered with a new owner, in which case the vehicle shall be inspected in accordance with this article before the registration.

C. No holder of a fleet emissions inspection station permit shall inspect or certificate any vehicle for which such permittee is not the registered owner or lessee, unless authorized by the director.

D. Vehicles which are owned by a licensed vehicle dealer and which are held for resale as a part of the dealer's business inventory shall be deemed a part of such dealer's vehicle fleet for purposes of this section.

E. Every vehicle subject to the provisions of this section and registered in this state shall be inspected in accordance with the provisions of this article at least once within each twelve-month period following any original registration or reregistration. No vehicle that is subject to the provisions of this section may be registered or reregistered until such vehicle has passed inspection or been issued a waiver pursuant to §49-542.

F. The director shall investigate the operation of each fleet emissions inspection station as the conditions and circumstances of such operation may indicate. He may require the holder of any fleet permit to submit such documentation required concerning the operation of such inspection station. The director may revoke and require the surrender and forfeiture of any fleet emissions inspection station permit and certificates of inspection of such permittee if he finds that such station is not operated in accordance with this article and the lawful rules and regulations adopted by the director or the holder of such permit has failed or refused to submit records or documentation required.

§49-547. Authority of director to acquire enforcement equipment.

The director may acquire in the name of the state by purchase, donation, dedication or other lawful means any special equipment, tools, materials or facilities needed to adequately administer or enforce the provisions of this article.

§49-548. Improper representation

A. A person shall not in any manner represent any place to be an official or fleet emissions inspection station unless such station has been established and is operated under a valid permit issued by the director.

B. A certificate of inspection shall not be issued to any vehicle except by a fleet emissions inspection station established and operating under a valid permit issued by the director. All certificates of inspection shall be serially numbered and shall be strictly accounted for.

§49-549. False certificates

A. A person shall not make, issue or knowingly use any imitation or counterfeit of an official certificate of inspection or a certificate of waiver.

B. A person shall not issue or cause or permit to be issued for any vehicle any certificate of inspection or a certificate of waiver knowing it to be fictitious or issued for another vehicle or issued without an inspection having been made.

§49-550. Violation; classification; civil penalty

A. Except as provided in subsection B of this section, any person who violates any provision of this article or any rule or regulation of the director adopted under this article is guilty of a class 2 misdemeanor.

B. Any person who makes or issues any imitation or counterfeit of an official certificate or certificates of inspection or waiver, is guilty of a class 5 felony.

C. Any person who knowingly demands or collects a fee for the inspection of a vehicle other than the fee fixed by the director for the inspection of vehicles of the same class is guilty of a class 2 misdemeanor.

D. Any person who makes or provides to the director the written statement required to obtain a certificate of waiver pursuant to section 49-542, subsection J, knowing the statement to be false, is guilty of a class 2 misdemeanor.

E. In addition to any other criminal penalty provided by law, a person who owns a vehicle and whose residence is located outside of a nonattainment area but who commutes in that vehicle to the driver's principal place of employment located within a nonattainment area without complying with this article is subject to a civil penalty of fifty dollars for a first violation of this subsection. For a second violation of this subsection within a one year period a court shall impose a civil penalty of three hundred dollars. A court shall impose a civil penalty of twenty-five dollars for a first time violation of this subsection if the owner presents evidence that the vehicle is in compliance with this article.

F. In addition to any other criminal penalty provided by law, any dealer licensed to sell motor vehicles, pursuant to Title 28, Chapter 8, whose place of business is located in a nonattainment area and delivers a vehicle that does not conform with this section is subject to a civil penalty of one thousand dollars for a first violation of this subsection. For the second violation of this subsection within a one year period a court shall impose a civil penalty of two thousand dollars and a suspension of their license for a period of ninety days.

§49-551. Air quality fee; fund; purpose

A. Every person who is required to register a motor vehicle in this state pursuant to section 28-302 shall pay, in addition to the registration fee, an air quality fee at the time of vehicle registration each year of one dollar fifty cents.

B. The registering officer shall collect the fees and immediately transmit the air quality fees to the state treasurer. The state treasurer shall deposit the fees in the air quality fund established pursuant to subsection C of this section.

C. An air quality fund is established in the Department of Environmental Quality consisting of monies received pursuant to this section and monies appropriated by the legislature. Monies in the air quality fund shall be used for:

1. Air quality research, experiments and programs conducted by or for the department for the purpose of bringing nonattainment areas into attainment status and improving air quality in areas of this state outside of the nonattainment areas and reducing levels of particulate and ozone pollution both inside and outside of nonattainment areas of this state.

2. Reimbursement to the highway user revenue fund in an amount determined by the department of transportation pursuant to section 28-1552.01.

3. Making grants to state departments or agencies or to political subdivisions of this state to promote the use of compressed natural gas in the vehicles operated by the state departments, agencies or political subdivisions. The amount of the grants in a fiscal year is two hundred fifty thousand dollars less the amount reimbursed to the

highway user revenue fund in the prior fiscal year pursuant to section 28-1552.01.

4. Determining the cause of visual air pollution in counties with a population in excess of four hundred thousand persons.

D. No disbursement or expenditure of monies in the air quality fund may be made for any purposes other than those set forth in Subsection C, E and G of this section.

E. The department shall allocate and the state treasurer shall distribute four hundred thousand dollars from the air quality fund to the Department of Transportation for the purposes prescribed by section 28-2611 in eight installments in each of the first eight months of a fiscal year.

F. This section does not apply to an electrically powered golf cart or an electrically powered vehicle.

G. Monies in the fund do not revert to the general fund. The department may make grants to a regional planning agency, county, city or town located within a nonattainment area for the purpose of air quality research or implementation of programs designed to accomplish the purposes of this section.

[*Editor's note:* Section 2 through 4 of Chapter 198, laws of 1989 provide:

"Sec. 2. *Brown cloud study; priority; counties with a population of one million two hundred thousand or more persons*

The department of environmental quality shall promptly conduct a study to determine the cause of visual air pollution in counties with a population of one million two hundred thousand or more persons using monies from the air quality fund. The department of environmental quality may contract with public or private entities to conduct the study. Notwithstanding any other law, if the department of environmental quality has not entered into the contract for the study required by this section and the pilot study pursuant to section 3 of this act by September 1, 1989, it shall not enter into any other contracts using monies from the air quality fund until the contract for the study provided for in this section is executed. Nothing in this paragraph shall be construed to prevent the department from completing or renewing a contract entered into prior to September 1, 1989.

Sec. 3. *Brown cloud studies; priority; counties with a population in excess of four hundred thousand but fewer than one million two hundred thousand persons*

The department of environmental quality shall promptly conduct studies to determine the cause of visual air pollution in counties with a population in excess of four hundred thousand persons but fewer than one million two hundred thousand persons using monies from the air quality fund. The department may contract with public or private entities to conduct the studies. The studies shall be conducted in two parts, a pilot study to be conducted during the fiscal year 1989-1990, and a large scale study to be conducted during the fiscal year 1990-1991. Notwithstanding any other law, if the department of environmental quality has not entered into the contract for the large scale study required by this section by September 1, 1990, it shall not enter into any other contracts using monies from the air quality fund until the contract for the study provided for in this section is executed. Nothing in this paragraph shall be construed to prevent the department from completing or renewing a contract entered into prior to September 1, 1990.

Sec. 4. *Appropriation; visual air pollution studies; causes*

The sum of one million dollars is appropriated from the air quality fund established pursuant to section 49-551, Arizona Revised Statutes, to the department of environmental quality during the fiscal year 1988-89 for the purpose of conducting studies to identify the causes of visual air pollution pursuant to section 2 and the pilot study conducted pursuant to section 3 of this act."]

§49-552. Enforcement on city, town or county property

A city, town or county shall prohibit the parking of vehicles which fail to comply with section 49-542 in an employee parking lot under its jurisdiction within a nonattainment area as defined in section 49-541.

§49-553. Reports to legislature by department of environmental quality

A. The Department of Environmental Quality with the support of the Department of Weights and Measures and the Department of Transportation shall develop data and report on the following:

1. The benefits, test methods and feasibility of testing gasoline and diesel powered vehicles for oxide of nitrogen and diesel powered vehicles for vehicle emissions.

2. The metropolitan air quality benefits derived from the emissions testing of vehicles registered in areas contiguous to the nonattainment areas for automotive related pollutants.

3. The effectiveness of the vehicle emissions testing program in reducing carbon monoxide and other forms of pollution.

4. The effectiveness of the measures set forth in Section 41-2083 and title 41, chapter 15, article 6 in reducing carbon monoxide and hydrocarbon emissions.

5. The results of studies which the director shall conduct showing the costs and benefits of the carbon monoxide reduction measures adopted by this chapter and recommendations as to how benefits may be increased and costs decreased.

CALIFORNIA

CHAPTER 5. MONITORING DEVICES

42700. The Legislature hereby finds and declares that stationary sources of air pollution are known to emit significant amounts of pollutants into the air, but that existing sampling techniques are not sufficiently precise to permit accurate measurement. The Legislature further finds and declares that more accurate data will improve the design of strategies for the control of such pollutants in the most cost-effective manner.

The Legislature further finds and declares that public complaints about excessive emissions from stationary sources are difficult or impossible to evaluate in the absence of adequate means of monitoring such emissions on a continuing basis. The Legislature further finds and declares that, although the state board and the districts are authorized under Section 41511 and 42303, to require stationary sources of air contaminants to install and operate monitoring devices to measure and record continuously the emissions concentration and amount of any specified pollutant, many districts have failed to exercise such authority.

The Legislature further finds and declares that all districts, especially the bay district, the districts located, in whole or part, within the South Coast Air Basin, and the San Diego County Air Pollution Control District should be encouraged to require that monitoring devices be installed in each stationary source of air contaminants which emits into the atmosphere 100 tons or more each year of nonmethane hydrocarbons, oxides of nitrogen, oxides of sulfur, reduced sulfur compounds, or particulate matter or 1,000 tons or more each year of carbon monoxide.

In order to encourage such action by the districts, the state board shall determine the availability, technological feasibility, and economic reasonableness of monitoring devices for such stationary sources as provided by Section 42701.

42701. (a) For the purposes of Sections 41511 and 42303, the state board shall determine the availability, technological feasibility, and economic reasonableness of monitoring devices to measure and record continuously the emissions concentration and amount of nonmethane hydrocarbons, oxides of nitrogen, oxides of sulfur, reduced sulfur compounds, particulate matter, and carbon monoxide emitted by stationary sources. Such determination shall be made for stationary sources which emit such contaminants in the quantities set forth in Section 42700, and may be made for stationary sources which emit lesser amounts. The state board shall complete an initial review of submitted devices by June 1, 1975.

42702. The state board shall specify the types of stationary sources, processes, and the contaminants, or combinations thereof, for which a monitoring device is available, technologically feasible, and economically reasonable. Such specification may be by any technologically based classification, including on an industry-wide basis or by individual stationary source, by air basin, by district, or any other reasonable classification.

42703. The state board shall require the manufacturer of any monitoring device submitted for a determination to reimburse the state board for its actual expenses incurred in making the determination, including, where applicable, its contract expenses for testing and review.

42704. After the board has made a determination of availability, the state board may, as appropriate, revoke or modify its prior determination of availability if circumstances beyond the control of the state board, or of a stationary source required to install a monitoring device, cause a substantial delay or impairment in the availability of the device or cause the device no longer to be available.

42705. Any stationary source required by the district in which the source is located to install and operate a monitoring device shall retain the records from the device for not less than two years and, upon request, shall make the records available to the state board and the district.

42706. Any violation of any emission standard to which the stationary source is required to conform, as indicated by the records of the monitoring device, shall be reported by the operator of the source to the district within 96 hours after such occurrence. The district shall, in turn, report the violation to the state board within five working days after receiving the report of the violation from the operator.

42707. The air pollution control officer shall inspect, as he determines necessary, the monitoring devices installed in every stationary source of air contaminants located within his jurisdiction required to have such devices to insure that such devices are functioning properly. The district may require reasonable fees to be paid by the operator of any such source to cover the expense of such inspection and other costs related thereto.

42708. This chapter shall not prevent any local or regional authority from adopting monitoring requirements more stringent than those set forth in this chapter or be construed as requiring the installation of monitoring devices on any stationary sources or classes of stationary sources. This section shall not limit the authority of the state board to require the installation of monitoring devices pursuant to Chapter 1 (commencing with Section 41500).

PART 5. VEHICULAR AIR POLLUTION CONTROL

CHAPTER 1. GENERAL PROVISIONS

43000. The Legislature finds and declares:

(a) That the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state.

(b) That the control and elimination of those air pollutants is of prime importance for the protection and preservation of the public health and well-being, and for the prevention of irritation to the senses, interference with visibility, and damage of vegetation and property.

(c) That the state has a responsibility to establish uniform procedures for compliance with standards which control or eliminate such air pollutants.

(d) That vehicle emission standards applied to new motor vehicles, and to used motor vehicles equipped with motor vehicle pollution control devices, are standards with which all vehicles shall comply.

43000.5. The Legislature further finds and declares:

(a) That despite the significant reductions in vehicle emissions which have been achieved in recent years, continued growth in population and vehicle miles traveled throughout California have the potential not only to prevent attainment of the state standards, but in some cases, to result in worsening of air quality.

(b) That the attainment and maintenance of the state air quality standards will necessitate the achievement of substantial reductions in new vehicle emissions and substantial improvements in the durability of vehicle emissions systems.

(c) That the burden for achieving needed reductions in vehicle emissions should be distributed equitably among various classes of vehicles, including both on- and off-road vehicles, light-duty cars and trucks, and heavy-duty vehicles, to accomplish improvements in both the emissions level and in-use performance and durability of all new motor vehicles.

(d) That the state board should take immediate action to implement both short- and long-range programs of across-the-board reductions in vehicle emissions which can be relied upon by the districts in the preparation of their attainment plans or plan revisions pursuant to Sections 40911, 40902, and 40925.

(e) That in order to attain the state and federal standards as expeditiously and equitably as possible, it is necessary for the authority of the state board to be clarified and expanded with respect to the control of motor vehicles and motor vehicle fuels.

43001. The provisions of this part shall not apply to any of the following:

(a) Racing vehicles.

(b) Motorcycles, except as otherwise provided in Section 43107.

(c) Implements of husbandry, as defined in Chapter 1 (commencing with Section 36000) of Division 16 of the Vehicle Code.

This section shall remain in effect only, until January 1, 1989, and as of that date is repealed, unless a later enacted statute, which is chaptered before January 1, 1989, deletes or extends that date.

43001. The provisions of this part shall not apply to:

(a) Racing vehicles.

(b) Motorcycles, except as otherwise provided in Section 43107.

This section shall become operative on January 1, 1989.

43002. No motor vehicle of historic interest shall be required to have any motor vehicle pollution control device, except for such devices that were required by this part for such vehicles prior to the time that special identification plates were issued for that vehicle pursuant to Section 5004 of the Vehicle Code.

43002.2. The state board shall waive the provisions of this division on a case-by-case basis for the purpose of allowing the importation of vehicles designed only for use for disabled persons.

43002.5. [Repealed]

43003. [Repealed]

43004. Except as otherwise provided in Section 43001, 43002, or 43005, the standards applicable under this part for exhaust emissions for gasoline-powered motor vehicles shall apply to motor vehicles which have been modified or altered to use a fuel other than gasoline or diesel.

43005. Section 43004 of this code, and Sections 4000.1 and 27156 of the Vehicle Code, shall not apply to a motor vehicle altered or modified to use a fuel other than gasoline or diesel completed prior to August 31, 1969.

43006. The state board may certify the fuel system of any motor vehicle powered by a fuel other than gasoline or diesel which meets the standards specified by Section 43004 and adopt test procedures for such certification.

43007. Whenever any motor vehicle is required to be equipped with any motor vehicle pollution control device by rules and regulations adopted by any district pursuant to Section 43658, such motor vehicle shall be equipped with such device.

43008. Except as provided by Sections 43100 and 43101 and Chapter 3 (commencing with Section 43600), all motor vehicles required pursuant to the National Emission Standards Act (42 U.S.C., Secs. 1875f-1 to 1857f-7, inclusive) and the standards and regulations promulgated thereunder, to be equipped with motor vehicle pollution control devices, shall be equipped with such devices required by that act.

43009. Except as otherwise provided in Section 43002, every motor vehicle subject to this part shall meet the standards adopted by the state board pursuant to Sections 27157 and 27157.5 of the Vehicle Code.

43009.5. (a) If, based on a review of information derived from a statistically valid and representative sample of vehicles, the state board determines that a substantial percentage of any class or category of vehicles certified under the optional standards of Section 43101.5, and of Section 1960.15 of Title 13 of the California Administrative Code, exhibits, prior to 75,000 miles or seven years, whichever occurs first, an identifiable, systematic defect in a component listed in paragraph (2) of subdivision (c) of Section 1960.15, which causes a significant increase in emissions above those exhibited by vehicles free of defects and of the same class or category and having the same period of use and mileage, the state board may invoke its enforcement authority under Section 43105 to require remedial action by the vehicle manufacturer. The remedial action shall be limited to owner notification and repair or replacement of the defective component. As used in this section, the term "defect" shall not include failures which are the result of abuse, neglect, or improper maintenance.

(b) Nothing in this section shall limit or otherwise affect the recall authority of the state board, except as provided in subdivision (a).

43010. With respect to the program designed and adopted by the Department of Consumer Affairs pursuant to Chapter 20.4 (commencing with Section 9889.50) of Division 3 of the Business and Professions Code, the state board shall, in time for the Department of Consumer Affairs to comply with the schedule specified in subdivisions (a) and (b) of Section 9889.55 of that code, after public hearings, prescribe maximum air pollution emission standards to be applied in inspecting motor vehicles.

In prescribing such standards, the state board shall undertake such studies and experiments as are necessary and feasible, evaluate available data, and confer with automotive engineers.

The standards shall be set at a level reasonably achievable for each class and model of motor vehicle when operating in a reasonably sound mechanical condition, allowing for the effects of installed motor vehicle pollution control devices, and the motor vehicle's age and total mileage. The standard shall be designed to secure the operation of all such motor vehicles, as soon as possible, with a substantial reduction in air pollution emissions, and shall be revised from time to time, as experience justifies.

43011. (a) The state board shall establish criteria for the evaluation of the effectiveness of motor vehicle pollution control devices. After the establishment of such criteria, the state board shall evaluate motor vehicle pollution control devices which have been submitted to it for testing.

(b) The criteria established by the state board pursuant to subdivision (a) shall include, but need not be limited to:

(1) Provisions for the testing of vehicles on which a device is installed, when an engineering evaluation of the device indicates such testing is warranted.

(2) A requirement that independent test data be supplied to the state board for each device it is requested to test.

43012. (a) For the purpose of enforcing or administering any federal, state, or local law, order, regulation, or rule relating to vehicular sources of emissions, the executive officer of the state board or an authorized representative of the executive officer, upon presentation of credentials or, if necessary under the circumstances, after obtaining an inspection warrant pursuant to Title 13 (commencing with Section 1822.50) of Part 3 of the Code of Civil Procedure, has the right of entry to any premises owned, operated, used, leased, or rented by any new or used car dealer, as defined in Sections 285, 286, and 426 of the Vehicle Code, for the purpose of inspecting any vehicle for which emissions standards have been enacted or adopted or for which emissions equipment is required and which is situated on the premises for the purpose of emission-related maintenance, repair, or service, or for the purpose of sale, lease, or rental whether or not the vehicle is owned by the dealer. The inspection may extend to all emission-related parts and operations of the vehicle, and may require the on-premises operation of an engine or vehicle, the on-premises securing of samples of emissions from the vehicle, and the inspection of any records which relate to vehicular emissions required by the Environmental Protection Agency or by any state or local law, order, regulation, or rule to be maintained by the dealer in connection with the dealer's business.

(b) The right of entry for inspection under this section is limited to the hours during which the dealer is open to the public, except when the entry is made pursuant to warrant or whenever the executive officer or an authorized representative has reasonable cause to believe that a violation of any federal, state, or local law, order, regulation, or rule has been committed in his or her presence. No vehicle shall be inspected pursuant to this section more than one time without an inspection warrant or without reasonable cause unless the vehicle undergoes a change of ownership or the inspection reveals that the vehicle has failed to comply with required emissions standards or equipment, in which case one additional inspection may be made to verify the violation or to verify that the violation has been corrected.

(c) With respect to vehicles not owned by the dealer, the state board may not prosecute, without the owner's knowledge or consent, any violation by the owner of any law pertaining to vehicular emissions unless prior notice of the inspection has been given to the owner.

(d) If the executive officer or authorized representative, upon inspection, finds that a used motor vehicle fails to comply with applicable emissions standards or equipment, the state board shall issue a notice to correct. Until all violations in the notice have been corrected and the dealer has sent proof of correction by certified mail to the state board, the motor vehicle shall prominently display the following disclosure affixed to the windshield in at least 18-point type:

NOT FOR SALE

THIS VEHICLE IS PRESENTLY NOT IN COMPLIANCE WITH THE CALIFORNIA VEHICLE POLLUTION CONTROL LAWS AND MAY NOT BE SOLD UNTIL A VALID CERTIFICATE OF COMPLIANCE HAS BEEN ISSUED.

Any dealer who sells a vehicle prohibited to be sold under this subdivision is subject to a civil penalty of not to exceed one thousand dollars ($1,000). For purposes of this subdivision, "proof of correction" shall consist of a copy of a certificate of compliance or noncompliance issued following the issuance of a notice to correct by a licensed test station or licensed repair station not affiliated with or owned by the dealer or any other proof of repair satisfactory to the inspecting officer. The dealer shall send the copy of the certificate of compliance or noncompliance by certified mail to the state board within three days of obtaining the certificate.

(e) Civil penalties may be assessed or recovered for one or more violations by a dealer involving the tampering with or disabling of a vehicles' air injection, exhaust gas recirculation, crankcase ventilation, fuel injection, or carburation systems, ignition timing or evaporative controls, fuel filler neck restrictor, oxygen sensor or electronic controls, or missing catalytic converter.

(f) No civil penalty or criminal penalty may be assessed for a violation by a dealer identified in a notice to correct as a result of an inspection under this section if the violation is related to lack of maintenance or customer tampering or vandalism, including, but not limited to, a missing gasoline filler cap and a disconnected or missing heated air intake tube or vacuum hose. However, if notices to correct are issued under this subdivision to more than 20 percent of the vehicles offered for sale on a dealer's premises during each of three consecutive inspections conducted 30 or more days apart during any one-year period, civil penalties may be assessed and recovered for each vehicle issued a notice to correct.

(g) If the executive officer or authorized representative, upon inspection, finds that a certificate of compliance or noncompliance was issued to a motor vehicle that fails to comply with applicable emissions standards or equipment, the state board shall immediately refer these findings to the department for investigation under Chapter 5 (commencing with Section 44000). The state board may refer any other suspected violation to the department for appropriate action.

(h) Notwithstanding Section 17150 of the Vehicle Code, the state shall be liable for any injury or damage caused by the negligent or wrongful act or omission of the operator of any vehicle which is operated pursuant to this section.

(i) This section provides the exclusive authority for inspections of motor vehicles for the purposes specified in this section.

(j) As used in this section, the terms "tampering" and "disabling" mean an unauthorized modification, alteration, removal, or disconnection.

(k) No civil penalty may be imposed, or administrative action taken to revoke a dealer's license, for any violation of this section involving a used motor vehicle occurring between January 1, 1988, and March 31, 1988.

43013. (a) The state board may adopt and implement motor vehicle emission standards, in-use performance standards, and motor vehicle fuel specifications for the control of air contaminants and sources of air pollution which the state board has found to be necessary, cost-effective, and technologically feasible to carry out the purposes of this division.

(b) The state board may, consistent with subdivision (a), adopt standards and regulations for light-duty and heavy-duty motor vehicles; medium-duty motor vehicles, as determined and specified by the state board; motorcycles; off-highway vehicles; construction equipment; farm equipment; utility engines; locomotives; and, to the extent permitted by federal law, marine vessels.

(c) Prior to adopting standards and regulations for farm equipment, the state board shall hold a public hearing and find and determine that the standards and regulations are necessary, cost-effective, and technologically feasible. The state board shall also consider the technological effects of emission control standards on the cost, fuel consumption, and performance characteristics of mobile farm equipment.

(d) Notwithstanding subdivision (b), the state board shall not adopt any standard or regulation affecting locomotives until the final study required under Section 5 of Chapter 1326 of the Statutes of 1987 has been completed and submitted to the Governor and Legislature.

43014. The state board may issue permits for the testing of experimental motor vehicle pollution control devices installed in used motor vehicles, or for the testing of experimental or prototype motor vehicles which appear to have very low emission characteristics.

43015. The Air Pollution Control Fund is continued in existence in the State Treasury. Upon appropriation by the Legislature, the money in the fund shall be available to the state board to carry out its duties and functions.

43016. Any person who violates any provision of this part, or any order, rule, or regulation of the state board adopted pursuant to this part, and for which violation there is not provided in this part any other specific civil penalty or fine, shall be subject to a civil penalty of not to exceed five hundred dollars ($500) per vehicle. Any penalty collected pursuant to this section shall be payable to the State Treasurer for deposit in the Air Pollution Control Fund.

43017. The state board may enjoin any violation of any provision of this part, or of any order, rule, or regulation of the state board, in a civil action brought in the name of the people of the State of California, except that the state board shall not be required to allege facts necessary to show, or tending to show, lack of adequate remedy at law or to show, or tending to show, irreparable damage or loss.

43018. (a) The state board shall endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state standards at the earliest practicable date.

(b) Not later than January 1, 1992, the state board shall take whatever actions are necessary, cost-effective, and technologically feasible in order to achieve, not later than December 31, 2000, a reduction in the actual emissions of reactive organic gases of at least 55 percent, a reduction in emissions of oxides of nitrogen of at least 15 percent from motor vehicles. These reductions in emissions shall be calculated with respect to the 1987 baseline year. The state board also shall take action to achieve the maximum feasible reductions in particulates, carbon monoxide, and toxic air contaminants from vehicular sources.

(c) In carrying out this section, the state board shall adopt standards and regulations which will result in the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuel, including, but not limited to, all of the following:

(1) Reductions in motor vehicle exhaust and evaporative emissions.

(2) Reductions in emissions from in-use emissions from motor vehicles through improvements in emission system durability and performance.

(3) Requiring the purchase of low-emission vehicles by state fleet operators.

(4) Specification of vehicular fuel composition.

(d) In order to accomplish the purposes of this division, and to ensure timely approval of the district's plans for attainment of the state air quality standards by the state board, the state board shall adopt the following schedule for workshops and hearings to consider the adoption of the standards and regulations required pursuant to this section:

(1) Workshops on the adoption of vehicular fuel specifications for aromatic content, diesel fuel quality, light-duty vehicle exhaust emission standards, and revisions to the standards for new vehicle certification and durability to reflect current driving conditions and useful vehicle life shall be held not later than March 31, 1989. Hearings of the state board to consider adoption of proposed regulations pursuant to this subdivision shall be held not later than November 15, 1989.

(2) Workshops on the adoption of regulations governing gasoline Reid Vapor Pressure, and standards for heavy-duty and medium-duty vehicle emissions, shall be held not later than January 31, 1990. Hearings of the state board to consider adoption of proposed regulations pursuant to this subdivision shall be held not later than November 15, 1990.

(3) Workshops on the adoption of regulations governing detergent content, emissions from off-highway vehicles, vehicle fuel composition, emissions from construction equipment and farm equipment, motorcycles, locomotives, utility engines, and to the extent permitted by federal law, marine vessels, shall be held not later than January 31, 1991. Hearings of the state board to consider adoption of proposed regulations pursuant to this subdivision shall be held not later than November 15, 1991.

43019. The state board may adopt, by regulation, a schedule of annual fees for the certification of motor vehicles and engines sold in the state to cover the costs of state programs authorized or required under this chapter related to mobile sources. The total amount of funds collected pursuant to this section shall not exceed four million five hundred thousand dollars ($4,500,000) in the 1989–90 fiscal year, and in any subsequent year shall not increase by an amount greater than the annual increase in the California Consumer Price Index, as determined pursuant to Section 2212 of the Revenue and Taxation Code, for the preceding year. The fees collected by the state board pursuant to this section shall be deposited in the Air Pollution Control Fund.

CHAPTER 2. NEW MOTOR VEHICLES

Article 1. General Provisions

43100. The state board may certify new motor vehicles and new motor vehicle engines pursuant to this article.

43101. The state board shall adopt and implement emission standards for new motor vehicles for the control of emissions therefrom, which standards the state board has found to be necessary and technologically feasible to carry out the purposes of this division. Prior to adopting such standards, the state board shall consider the impact of such standards on the economy of the state, including, but not limited to, their effect on motor vehicle fuel efficiency. The state board shall submit a report of its findings on which the standards are based to the Legislature within 30 days of adoption of the standards.

Such standards may be applicable to motor vehicle engines, rather than to motor vehicles.

43101.5. The emission standards adopted by the state board pursuant to Section 43101 for the 1983 and later model-year motor vehicles shall be limited by the following:

(a) For all gasoline-powered passenger vehicles prior to the 1986 model year, the state board shall not adopt primary standards for the emission of oxides of nitrogen which are more stringent than 0.7 grams per vehicle mile, unless the state board by regulation also provides for optional standards which are not more stringent, with respect to each constitutent, than 0.39 grams per vehicle mile for nonmethane hydrocarbon, 7.0 grams per vehicle mile for carbon monoxide, and 0.7 grams per vehicle mile for oxides of nitrogen. For gasoline-powered light-duty vehicles and medium-duty vehicles prior to the 1986 model year of less than 4,000 pounds unladen weight, the state board shall not adopt primary standards for the emission of oxides of nitrogen which are more stringent than 1.0 gram per vehicle mile, unless the state board by regulation also provides for optional standards which are not more stringent, with respect to each constituent, than 0.39 grams per vehicle mile for nonmethane hydrocarbon, 9.0 grams per vehicle mile for carbon monoxide, and 1.0 gram per vehicle mile for oxides of nitrogen. Any option may not impose certification, warranty, or enforcement requirements of greater duration or stringency than those set forth in the regulations applicable to 1983 and later model years, as adopted or amended by the state board on May 20, 1981.

(b) If the state board intends by regulation to eliminate for 1986 and later model-year vehicles the optional standards specified in subdivision (a), the state board shall submit to the Legislature, not later than January 15th of the year which is at least two calendar years prior to the year in which production would commence of vehicles subject to the new standard, a report with an estimate of the air quality benefits of the more stringent standard, the technological and economic feasibility of requiring the standard, and the potential effects on fuel economy associated with the standard. The state board shall consult with the Environmental Protection Agency and motor vehicle and engine manufacturers prior to submitting the air quality and fuel economy estimates.

43102. (a) No new motor vehicle or new motor vehicle engine shall be certified by the state board, unless the vehicle or engine, as the case may be, meets the emission standards adopted by the state board pursuant to Section 43101 under test procedures adopted by the state board pursuant to Section 43104.

(b) Notwithstanding subdivision (a), to assure that California consumers have an adequate selection of light-duty motor vehicle models, the state board shall adopt certification and enforcement regulations for future model years as soon as practicable, but not later than for the 1983 and subsequent model years, which will allow a manufacturer to certify in California federally certified light-duty motor vehicles with any engine family or families when their emissions are offset by the manufacturer's California certified motor vehicles whose emissions are below the applicable California standards. This exemption shall not apply to emergency vehicles, as defined in Section 2002 of Title 15 of the United States Code.

(c) Subdivision (b) shall not be applicable to any vehicle or engine model which is certified to meet the emission standards established pursuant to Section 43101 or 43101.5.

43103. (a) Except as provided in subdivision (b), the state board may adopt a schedule of nonconformance fees applicable to manufacturers of heavy-duty vehicles and heavy-duty vehicle engines which are unable to comply with emissions standards adopted pursuant to Section 43101 for those vehicles and engines. Upon adoption and implementation of the schedule by the state board, a manufacturer of a heavy-duty vehicle or heavy-duty vehicle engine to which a standard adopted pursuant to Section 43101 applies may, notwithstanding subdivision (a) of Section 43102, elect to pay to the state board the fee applicable to any vehicle or engine failing to meet the standard.

(b) The state board shall establish nonconformance fees only for those heavy-duty vehicles or engines for which it has adopted emission standards and test procedures which are identical to the corresponding federal emission standards and test procedures.

(c) Any regulations adopted by the state board under this section shall be identical to the nonconformance requirements, procedures, and fees established by the federal Environmental Protection Agency, pursuant to Section 206(g) of the federal Clean Air Act (42 U.S.C. Sec. 7525(g)) and Subparts A, K, and L of Part 86 of Title 40 of the Code of Federal Regulations, for the same heavy-duty vehicles or engines. Under the federal nonconformance fee program, the schedule of fees may be different in amount for each air pollutant tested, may be different for vehicles or engines of different classes or categories, and shall do all of the following:

(1) Take into account the extent to which actual emissions exceed the applicable standard.

(2) Provide for annual increases to achieve compliance with the applicable standard as quickly as is technologically feasible.

(3) Ensure that the manufacturers which are in compliance with the applicable standard suffer no competitive disadvantage from that compliance.

(d) Any warranty required under Section 43106 or 43204, and any action required by the state board under Section 43105, are applicable only to the emissions levels for which certification is granted under this section.

(e) All fees collected under this section shall be deposited in the Air Pollution Control Fund.

(f) This section shall remain in effect only until January 1, 1999, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 1999, deletes or extends that date.

43104. For the certification of new motor vehicles or new motor vehicle engines, the state board shall adopt, by regulation, test procedures to determine whether such vehicles or engines are in compliance with the emission standards established pursuant to Section 43101. The state board shall base its test procedures on federal test procedures or on driving patterns typical in the urban areas of California.

43105. No new motor vehicle, new motor vehicle engine, or motor vehicle with a new motor vehicle engine required pursuant to this part to meet the emission standards established pursuant to Section 43101 shall be sold to the ultimate purchaser, offered or delivered for sale to the ultimate purchaser, or registered in this state if the manufacturer has violated emission standards or test procedures and has failed to take corrective action, which may include recall of vehicles or engines, specified by the state board in accordance with regulations of the state board. If a manufacturer contests the necessity for, or the scope of, a recall of vehicles or engines ordered pursuant to this section and so advises the state board, the state board shall not require such recall unless it first affords the manufacturer the opportunity, at a public hearing, to present evidence in support of the manufacturer's objections. If a vehicle or engine is recalled pursuant to this section, the manufacturer shall make all necessary corrections specified by the state board without charge to the registered owner of the vehicle or vehicle with such engine or, at the manufacturer's election, reimburse the registered owner for the cost of making such necessary corrections.

The procedures for determining, and the facts constituting, compliance or failure of compliance shall be established by the state board.

43106. Each new motor vehicle or engine required pursuant to this part to meet the emission standards established pursuant to Section 43101 shall be, in all material respects, substantially the same in construction as the test motor vehicle or engine, as the case may be, which has been certified by the state board in accordance with this article. However, changes with respect to new motor vehicles or engines previously certified may be made if such changes do not increase emissions above the standards under which those motor vehicles or engines, as the case may be, were certified and are made in accordance with procedures specified by the state board.

43107. (a) The state board may, by regulation, adopt emission standards for new 1977 and later model year motorcycles registered or identified by the Department of Motor Vehicles which are sold in the state on or after July 1, 1976, or such later date as established by the state board by regulation.

(b) Motorcycles shall be exempt from the provisions of Section 43200.

43107.5. [Repealed]

43108. (a) In lieu of certification pursuant to Section 43102, the state board may certify a new motor vehicle designed for exclusive use as a schoolbus, or a new motor vehicle engine intended for use in a schoolbus, if the Administrator of the Environmental Protection Agency has granted a certificate of conformity for the schoolbus or engine pursuant to the Clean Air Act (42 U.S.C. Sec. 1857 et seq.).

(b) The state board shall grant a certification pursuant to subdivision (a) only if the manufacturer of the schoolbus or engine demonstrates that an engine suitable for use in the manufacturer's standard type of schoolbus which meets the applicable emissions standards established by the state board pursuant to Section 43102 is not available for installation.

(c) The state board, prior to granting a certification pursuant to subdivision (a), shall require a showing by the manufacturer of the schoolbus or engine of a good faith effort to procure or manufacture an engine which meets the standards established by the state board pursuant to Section 43102, and, in the case of the schoolbus manufacturer, a good faith effort to accomplish a schoolbus redesign to accommodate such an engine. In the absence of these showings, the state board shall not grant a certification pursuant to subdivision (a).

Article 1.5. [Omitted]

Article 2. Manufacturers and Dealers

43200. The state board may adopt a regulation to prohibit the sale and registration in this state of any new motor vehicle certified by the state board to which there has not been securely affixed on a side window to the rear of the driver or, if it cannot be so placed, to the windshield of the motor vehicle in accordance with paragraph (3) of subdivision (b) of Section 26708 of the Vehicle Code, by the manufacturer a decal on which the manufacturer shall endorse clearly, distinctly, and legibly true and correct entries disclosing the following information concerning such motor vehicle:

(a) The emission standards adopted by the state board pursuant to Section 43101 which are applicable to that motor vehicle.

(b) For 1976 and subsequent model year motor vehicles, the exhaust emissions, based on quality audit tests of assembly line motor vehicles or, if required by the state board, as determined by the factory assembly line test for that motor vehicle, and, at the beginning of each model year, based on certification fleet data.

Any such regulation may be adopted only if the state board finds that the regulation is (1) necessary to enforce or assure compliance with applicable statutes, standards, or procedures relating to vehicle emissions or (2) necessary for the protection and information of consumers.

Nothing in this division or in any other statute shall be construed as prohibiting a purchaser from removing the decal required by this section, after the purchaser has taken possession of the vehicle.

43201. Any dealer or person holding a retail seller's permit who sells a new motor vehicle without the decal required by Section 43200 shall be subject to a civil penalty of not to exceed one thousand dollars ($1,000).

Any penalty recovered pursuant to this section shall be deposited into the General Fund.

43202. No new motor vehicle required to meet the emission standards adopted by the state board pursuant to Section 43101 shall be sold and registered in this state unless the manufacturer thereof permits the state board to conduct surveillance testing of emissions of new motor vehicles at the assembly facilities, or at any other location where the manufacturer's assembly line testing is performed and assembly line testing records are kept.

Authorization for the sale and registration of any new motor vehicle in this state may be rescinded or withheld if, at any time, the state board is prevented by the manufacturer from conducting surveillance of assembly line testing.

43203. (a) In connection with surveillance of emissions from new motor vehicles prior to their retail sale, the state board may, by regulation, impose fees on manufacturers of these vehicles to recover the state board's costs in conducting this surveillance.

(b) A manufacturer who fails to pay a fee imposed pursuant to this section within 60 days after receiving an invoice shall pay the state board an additional fee equal to 10 percent of the fee specified in subdivision (a). If the manufacturer notifies the state board, within 60 days after receiving the invoice, that additional information is needed to honor the invoice, the state board shall grant an additional 90 days for payment without the imposition of an additional fee. An additional interest fee equal to the rate of interest earned by the Pooled Money Investment Fund shall be imposed upon the fee specified in subdivision (a) and the additional fees specified in this subdivision and subdivision (c) for each 30-day period for which they remain unpaid, commencing 60 days after the receipt of the original invoice.

(c) A manufacturer who fails to pay all the fees imposed pursuant to this section within one year from the date of receipt of the original invoice shall pay a penalty fee equal to 100 percent of the fees imposed pursuant to subdivisions (a) and (b). A manufacturer who fails to pay all the fees and penalties imposed pursuant to this section within two years from the date of receipt of the original invoice shall pay a penalty equal to 100 percent of the fees and penalties imposed pursuant to subdivisions (a) and (b) and to this subdivision, for each one-year period for which they remain unpaid.

(d) Fees authorized by this section shall be imposed only for surveillance of emissions from new motor vehicles actually conducted.

(e) Notwithstanding Section 13340 of the Government Code, all fees collected pursuant to subdivision (a) are continuously appropriated to the state board, to be credited as a reimbursement of the board's costs incurred in its program for the surveillance of emissions from new vehicles. All fees collected pursuant to subdivisions (b) and (c) shall be deposited by the state board into the Air Pollution Control Fund.

43203.5. The state board shall adopt, by regulation, a certification program for new direct import vehicles. As used in this section, "new direct import vehicle" means any light duty motor vehicle manufactured outside of the United States and not intended by the manufacturer for sale in the United States which is less than two years old and was not certified by the state board pursuant to Article 1 (commencing with Section 43100). The state board shall issue a certificate of conformance to each new direct import vehicle which meets the requirements of the certification program. Any bonding requirements for the certification program may not exceed one thousand dollars ($1,000) per new direct import vehicle or engine.

The model year designation for new direct import vehicles in an engine family shall be determined on the same basis as vehicles in the same engine family which are offered for sale in California by the manufacturer. The model year designation for any new direct import motor vehicle in an engine family which the manufacturer does not offer for sale in California shall be determined in accordance with the regulations adopted by the state board. The designations shall apply for all purposes of the certification program and for registration of new direct import vehicles.

The state board shall, by regulation, impose fees to recover the state board's costs, including enforcement costs, of administration of the certification program. Failure to pay the fees within 60 days of receipt after notification by the state board shall result in the assessment of a 10 percent penalty. An additional interest assessment on the fees equivalent to the rate earned by the Pooled Money Investment Fund shall accrue at the end of each 30-day period that the fees remain unpaid. Nonpayment of the fees for more than one year shall result in the state board withholding future certification of new vehicles for sale in California.

Fees collected in accordance with this section shall be deposited in the Air Pollution Control Fund.

43204. (a) The manufacturer of each motor vehicle and each motor vehicle motor vehicle or motor vehicle engine manufactured prior to the 1990 model-year shall warrant to the ultimate purchaser and each subsequent purchaser that the motor vehicle or motor vehicle engine is:

(1) Designed, built, and equipped so as to conform, at time of sale, with the applicable emission standards specified in this part.

(2) Free from defects in materials and workmanship which cause such motor vehicle or motor vehicle engine to fail to conform with applicable regulations for its useful life as determined pursuant to subdivision (b).

(b) As used in subdivision (a) "useful life" of a motor vehicle or motor vehicle engine means:

(1) In the case of light-duty motor vehicles, and motor vehicle engines used in such motor vehicles, a period of use of five years or 50,000 miles whichever first occurs, except that, in the case of fuel metering and ignition systems and their component parts which are contained in the state board's "Emissions Warranty Parts List"

dated December 14, 1978 (items I(A), I(C), III(A), III(C), III(E), IX(A), and IX(B)), and which are contained in vehicles or vehicle engines certified to the optional standards pursuant to Section 43101.5 and subject to subdivision (a) of Section 43009.5, "useful life" means a period of use of two years or 24,000 miles, whichever occurs first.

(2) In the case of any other motor vehicle or motor vehicle engine, a period of use of five years or 50,000 miles, whichever first occurs, unless the state board determines that a period of use of greater duration or mileage is appropriate.

43205. (a) Commencing with the 1990 model-year, the manufacturer of each light-duty and medium-duty motor vehicle and motor vehicle engine shall warrant to the ultimate purchaser and each subsequent purchaser that the motor vehicle engine meets all of the following requirements:

(1) Is designed, built, and equipped so as to conform with the applicable emissions standards specified in this part for a period of use of five years or 50,000 miles, whichever first occurs.

(2) Is free from defects in materials and workmanship which cause the motor vehicle or motor vehicle engine to fail to conform with applicable requirements specified in this part or to fail to pass a test established under Section 44012 for three years or 50,000 miles, whichever first occurs.

(3) Is free from defects in materials and workmanship in emission related parts which, at the time of certification by the state board, are estimated by the manufacturer to cost individually more than three hundred dollars ($300) to replace, for a period of seven years or 70,000 miles, whichever first occurs.

(b) The state board shall, by regulation, periodically revise the three hundred dollar ($300) repair cost level specified in paragraph (3) of subdivision (a) in accordance with the consumer price index, as published by the United States Bureau of Labor Statistics.

43205. (5) Commencing with the 1990 model-year, the manufacturer of each motor vehicle and motor vehicle engine, other than a light-duty or medium-duty motor vehicle or motor vehicle engine, shall warrant to the ultimate purchaser and each subsequent purchaser that the motor vehicle or motor vehicle engine meets all of the following requirements:

(a) Is designed, built, and equipped so as to conform with the applicable emission standards specified in this part for a period of use determined by the state board.

(b) Is free from defects in materials and workmanship which cause the motor vehicle or motor vehicle engine to fail to conform with applicable requirements specified in this part for the same or lesser period of use established under subdivision (a).

43206. Commencing January 1, 1982, and annually thereafter, every person who manufacturers new motor vehicles for sale in California shall file with the state board a report as to the person's efforts and progress in meeting state standards adopted pursuant to Section 43101 and federal standards and research objectives specified in Section 7521 of Title 42 of the United States Code.

The reports shall be available to the public. However, the manufacturer may designate that a portion of the report is a trade secret and the portion shall not be released except to the state board employees as are specifically designated by the executive officer, unless the state board, after an investigation, determines that the portion is not in fact a trade secret. State board employees having access to the trade secret shall maintain its confidentiality.

The state board shall conduct investigations with respect to the reports as it deems necessary and shall file a summary of the annual reports with the Legislature and the Governor as soon after January 1 as possible.

No report is required from a manufacturer once all models of motor vehicles of the manufacturer which are sold in California and which are subject to the state standards adopted pursuant to Section 43101, and the federal standards and research objective specified in Section 7521 of Title 42 of the United States Code, meet all those standards and objectives.

43207. The state board may revoke outstanding certification of new motor vehicles for sale in California if the manufacturer thereof willfully fails to file any semiannual report required by Section 43206 or files a report which is deemed by the state board to inadequately describe the manufacturer's efforts and progress.

The state board may also withhold future certification of such manufacturer's vehicles until such time as the manufacturer offers for sale in California vehicles which meet the standards promulgated pursuant to Section 1857f-1 (b) (1) of Title 42 of the United States Code.

43208. Factory assembly line test procedures shall not apply to light-duty motor vehicles, if (a) the manufacturer thereof advises the state board in writing that the manufacturer does not intend to sell more than 1,000 motor vehicles in California in a given model year, and (b) the manufacturer does not sell more than 1,000 motor vehicles of its make in such a year. Nothing in this section shall be construed to prohibit the state board from requiring testing by the applicable certifying test procedure of up to 2 percent of the motor vehicles of such a manufacturer sold in California. This section shall not apply to 1976 and later model year motor vehicles.

43209. No manufacturer or distributor who pays a penalty pursuant to Section 43212 shall add the amount of such penalty to the cost of any motor vehicles sold by such manufacturer, and any provision of any contract of sale including such penalty as part of the cost of a motor vehicle shall be void and unenforceable.

43210. (a) The state board shall provide, by regulation, for the testing of motor vehicles on factory assembly lines or in a manner which the state board determines best suited to carry out the purpose of this part and this section.

(b) If a motor vehicle does not meet the prescribed assembly line standards, the motor vehicle may be retested according to the official test procedures upon which original certification for that make and model vehicle was based. Any motor vehicle meeting the applicable emission standards by either of the testing procedures shall be deemed to meet the emission standards of the State of California and shall be eligible for sale in this state.

(c) The regulations adopted by the state board pursuant to subdivision (a) shall provide for reduced, statistically valid testing of motor vehicles contained in large engine families and for which initial test results indicate compliance with the applicable standards.

43210.5. The state board shall, by regulation, require manufacturers of motor vehicles and motor vehicle engines to determine the extent to which emissions-related defects exist in each engine family and to recommend the diagnostic and repair procedures that can result in the identification and correction of these defects under vehicle inspection and maintenance programs.

43211. No new motor vehicle shall be sold in California that does not meet the emission standards adopted by the state board, and any manufacturer who sells, attempts to sell, or causes to be offered for sale a new motor vehicle that fails to meet the applicable emission standards shall be subject to a civil penalty of five thousand ($5,000) for each such action.

Any penalty recovered pursuant to this section shall be deposited into the General Fund.

43212. Any manufacturer or distributor who does not comply with the emission standards or the test procedures adopted by the state board shall be subject to a civil penalty of fifty dollars ($50) for each vehicle which does not comply with the standards or procedures and which is first sold in this state. The payment of such penalties to the state board shall be a condition to the further sale by such manufacturer or distributor of motor vehicles in this state.

Any penalty recovered pursuant to this section shall be deposited into the Air Pollution Control Fund.

43213. Sections 43211 and 43212 shall be enforced by the state board, and may be enforced by the Department of the California Highway Patrol, the Department of Motor Vehicles, and the Bureau of Automotive Repair in the Department of Consumer Affairs.

CHAPTER 3. USED MOTOR VEHICLES

Article 1. Device Certification

43600. The state board shall adopt and implement emission standards for used motor vehicles for the control of emissions therefrom, which standards the state board has found to be necessary and technologically feasible to carry out the purposes of this division; however, the installation of certified devices on used motor vehicles shall not be mandated except by statute. Such standards may be applicable to motor vehicle engines, rather than to motor vehicles.

43601. The state board shall certify exhaust devices for 1955 through 1965 model year motor vehicles.

43602. An exhaust device certified by the state board pursuant to Section 43601 shall not allow emissions exceeding any of the following:

(a) 350 parts per million hydrocarbons.

(b) 2 percent carbon monoxide.

(c) 800 parts per million nitrogen oxide.

However, if no exhaust device meets all three of the maximums specified in subdivisions (a), (b), and (c), the state board may certify an exhaust device which meets any two of the three maximums specified, if the installation of such a device in a motor vehicle would not increase the other emission in excess of the emission of that pollutant by the vehicle in the absence of such a device.

If two or more exhaust devices are certified that they meet the requirements of this section, the state board may not require the installation of more than one exhaust device on any motor vehicle.

43603. The state board shall adopt, by regulation, criteria for the certification of exhaust devices pursuant to Section 43601. Such criteria shall include, but not be limited to, requirements that:

(a) The device meets the cost and performance requirement specified in Section 43604.

(b) The device shall not allow exhaust emissions exceeding the amount specified in Section 43602.

(c) The manufacturer of the device comply with Section 43635.

43604. An exhaust device certified pursuant to Section 43601:

(a) Shall not cost, including the cost of installation, more than eighty-five dollars ($85).

(b) Shall not require maintenance more than once each 12,000 miles of operation, and such maintenance shall not cost, including the cost of parts and labor, more than fifteen dollars ($15).

(c) Shall equal or exceed the performance criteria established by the state board for such devices for new motor vehicles or, in the alternative, have an expected useful life of at least 30,000 miles of operation.

43610. The state board shall set standards for, and certify, exhaust devices to significantly reduce the emission of oxides of nitrogen from 1966 through 1970 model year motor vehicles, as determined by the state board from a representative sampling of such motor vehicles, which the state board has found to be necessary and technologically feasible to carry out the purposes of this division.

In setting standards under this section, the primary consideration shall be the greatest possible reduction of oxides of nitrogen.

43611. The state board shall adopt, by regulation, criteria for the certification of exhaust devices pursuant to Section 43610. Such criteria shall include, but not be limited to, requirements that:

(a) The device meets the cost and performance requirements specified in Section 43612.

(b) The device shall not allow exhaust emissions of oxides of nitrogen exceeding the standard adopted by the state board pursuant to Section 43610.

(c) The manufacturer of the device comply with Sections 43613 and 43635.

43612. An exhaust device certified pursuant to Section 43610:

(a) Shall not cost, including the cost of installation, more than thirty-five dollars ($35).

(b) Shall not require maintenance more than once each 12,000 miles of operation, and such maintenance shall not cost, including the cost of parts and labor, more than fifteen dollars ($15).

(c) Shall equal or exceed the performance criteria established by the state board for devices for new motor vehicles or, in the alternative, have an expected useful life of at least 50,000 miles of operation.

43613. The manufacturer of an exhaust device certified pursuant to Section 43610 shall include, with the sale of such device, instructions setting forth what steps the purchaser should take to maintain such device in proper working condition.

43614. After one or more devices are initially certified pursuant to Section 43610, no device shall be certified under that section which is less effective than the one or ones initially certified. Any subsequent certification of a more effective device shall not affect the certification of a previously certified device.

43630. (a) In addition to certifying devices which meet the standards set forth in, or established pursuant to, Sections 43602 and 43610, the state board shall adopt standards for certifying exhaust devices which achieve a reduction of the emission of hydrocarbons, carbon monoxide, and oxides of nitrogen from the exhaust of a motor vehicle substantially below the standards for any two pollutants set forth in, or established pursuant to Sections 43602 or 43610.

If, however, an exhaust device is shown to substantially reduce the emission of any two of the three pollutants, the state board may certify such a device, so long as the installation of such device in a motor vehicle does not increase the emission of the other pollutant in excess of that pollutant by the vehicle in the absence of such a device.

(b) Devices certified pursuant to this section may be certified without regard to the provisions of subdivision (a) of Section 43604 or subdivision (a) of Section 43612.

(c) After one or more such devices are initially certified, no device shall be certified pursuant to this section which is substantially less effective than any device previously certified, unless the state board determines, pursuant to a cost-benefit analysis, that such less effective device is also substantially less costly and therefore merits certification. Any subsequent certification of a more effective device shall not affect the certification of a previously certified device.

(d) The state board may permit the installation of a device certified pursuant to this section in lieu of any certified motor vehicle pollution control device which is required to be installed pursuant to any other provision of state law, if the installation of such device on that particular classification of motor vehicles results in no greater emissions than if the required certified device were operative over the life of the vehicle. The applicant shall be responsible for proving compliance with this subdivision and with other applicable criteria. Certificates of compliance shall be required upon the installation of a device certified pursuant to this section and installed pursuant to this subdivision, as if it were a device required by any other provision of state law.

43635. As a condition to the certification of any motor vehicle pollution control device required under this chapter, except Section 43630, the manufacturer of such a device, in order to protect the public interest, shall agree to either of the following:

(a) That, until two or more devices are certified for the same subclassification of motor vehicles, he enter into such cross-licensing or other agreements the state board determines, after a public hearing, are necessary to insure adequate competition among manufacturers of such devices.

(b) That, if his device is the only one made available to the public, the retail price of the device, including installation, does not exceed the price established, after a public hearing by the state board for that device.

43636. (a) In establishing the fair and reasonable retail price for a motor vehicle pollution control device for purposes of subdivision (b) of Section 43635, the state board shall take into consideration the cost of manufacturing the device and the manufacturer's suggested retail price.

(b) The price established by the state board shall, in no case, exceed the amount specified in subdivision (a) of Section 43604 or subdivision (a) of Section 43612, as the case may be.

43640. The state board may revoke, suspend, or restrict a certification of a previously certified device, or an exemption previously granted, upon a determination by the state board that the device no longer operates within the applicable criteria and standards adopted by the state board or no longer should be exempted.

Such a determination may be based on any relevant information, including, but not limited to, a change in the device, significant differences between certified and production models, or new data which bear upon the applicable certification criteria or standards and require the revocation of the device.

43641. Proceedings to review the denial of an application for certification or exemption, or proceedings to revoke, suspend, or restrict a certification previously granted by the state board, shall, upon the timely request of the applicant or affected manufacturer, be conducted by the state board in accordance with the provisions of Chapter 5 (commencing with Section 11500), Part 1, Division 3, Title 2 of the Government Code, and the state board shall have all the powers granted therein to the Office of Administrative Hearings.

43642. Certification for a motor vehicle pollution control device may be revoked by the state board, if the actual cost of the device installed exceeds the cost permitted by law or established pursuant to subdivision (b) of Section 43635.

43643. Any motor vehicle equipped with a certified device shall not be deemed in violation of the provisions of this part, or Section 27156 of the Vehicle Code, because the certification of the device is subsequently revoked, suspended, or restricted.

Replacement parts for the device may continue to be supplied and used for such vehicle, unless the revocation, suspension, or restriction is based upon a finding that the certified device has been found to be unsafe in actual use or is otherwise mechanically defective, in which event the device shall be brought into compliance with the provisions of this part within 30 days after such a finding.

43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor.

(b) Subdivision (a) shall not preclude any person from installing, selling, offering for sale, or advertising a device as a motor vehicle pollution control device for use on a particular classification of used motor vehicles if the state board has found that the installation of the device on that particular classification of used motor vehicle results in such vehicles meeting the state exhaust emissions standards.

43645. Whenever the state board certifies a motor vehicle pollution control device for the control of emissions of pollutants from a particular source of emissions from motor vehicles for which standards have been set by this part or by the state board, it shall so notify the Department of Motor Vehicles, the Department of the California Highway Patrol, and the Bureau of Automotive Repair in the Department of Consumer Affairs.

Article 2. Certified Device Installation

43650. Every 1955 and later model motor vehicle shall be equipped with the certified device as required by the Department of Motor Vehicles Manual of Registration Procedures as of January 1, 1975, or as amended to reflect the adoption of rules and regulations by a district board pursuant to Section 43658.

43651. Every 1963 or later model year motor vehicle, subject to registration in this state, shall be equipped with a certified device to control its crankcase emissions.

43652. Except as provided in Section 43657, every 1955 through 1965 model year motor vehicle, subject to registration in this state, upon either transfer of ownership and registration, or upon initial registration of such vehicle not previously registered in this state, shall be equipped with a certified device to control its exhaust emissions in accordance with a schedule of installation adopted by the state board.

43653. Every 1966 or later model year motor vehicle, subject to registration and first sold and registered in this state, shall be equipped with a certified device to control its crankcase emissions and exhaust emissions.

43654. (a) Except as otherwise provided in subdivision (b), every 1966 through 1970 light-duty motor vehicle, subject to registration in this state, shall be equipped with a certified device to control its exhaust emission of oxides of nitrogen upon initial registration, upon transfer of ownership and registration, and upon registration of a motor vehicle previously registered outside this state.

(b) Subdivision (a) shall not apply to a 1966 through 1970 light-duty motor vehicle (1) which is registered to, or subject to registration by, an elderly low-income person, (2) which was purchased from a person other than a dealer or a person holding a retail seller's permit, and (3) which is used principally by or for the benefit of the elderly low-income person. However, only one vehicle described above shall be registered to, or subject to registration by, the elderly low-income person at any one time.

(c) For purposes of subdivision (b), the Department of Motor Vehicles may require satisfactory proof (1) of the age of the transferee of the motor vehicle, (2) of the combined adjusted gross income of the household in which the transferee resides, and (3) that the transferor of the motor vehicle is a person other than a dealer or a person holding a retail seller's permit.

43655. (a) The state board shall adopt, by regulation, schedules of installation for purposes of Section 43652, after consultation with the Department of the California Highway Patrol, the Department of Motor Vehicles, and the Bureau of Automotive Repair in the Department of Consumer Affairs.

(b) In establishing such schedules, the state board shall consider all relevant factors, including, but not limited to, the burden of enforcement on the Department of the California Highway Patrol, the Department of Motor Vehicles, and the Bureau of Automotive Repair in the Department of Consumer Affairs, the need for rapid installation of motor vehicle pollution control devices in order to preserve and protect the public health, and the existing ambient air quality in the air basins.

43656. The state board may exempt from any schedule of installation adopted pursuant to Section 43654 or 43655:

(a) Motor vehicles or classifications or subclassifications of motor vehicles for which certified devices are not available.

(b) Motor vehicles or classifications or subclassifications of motor vehicles whose emissions are found by appropriate tests to meet applicable emission standards without an additional motor vehicle pollution control device.

(c) Implements of husbandry.

(d) Vehicles which qualify for special identification plates pursuant to Section 5004 of the Vehicle Code.

43656.5. The charge that can be made for the inspection and certification of exemption granted by the state board pursuant to Section 43656 shall not exceed three-tenths (0.3) of one hour multiplied by the hourly labor rate charged by the particular garage or service station.

The charge shall be posted as a fixed fee.

43657. The state board may also exempt, from the schedule of installation adopted pursuant to Section 43655, any motor vehicle registered to an owner whose residence is in a county, or portion thereof, which the state board finds, after a public hearing, that the installation of a certified device pursuant to Section 43652 to control exhaust emissions is not necessary or desirable to preserve and protect the public health and the existing ambient air quality thereof.

43658. (a) If the evidence submitted at a public hearing indicates that, in order to preserve the ambient air quality of a district, it is necessary that every 1955 through 1965 model year motor vehicle within the district be equipped with device or devices certified by the state board to control emissions of pollutants from the crankcase or exhaust, the district board may adopt rules and regulations to require the installation of such devices.

(b) The rules and regulations shall provide for a schedule of installation by which the motor vehicles are to be equipped with certified device, taking into consideration the number of motor vehicles to be equipped, the availability of such devices, and the availability of licensed installers to install such devices.

(c) The district board shall coordinate its activities pursuant to this section with the Department of the California Highway Patrol and the Department of Motor Vehicles in order to insure adoption of procedures which will facilitate enforcement of the rules and regulations adopted pursuant to this section.

43659. (a) The state board shall annually review the requirement that an exhaust device be installed on every 1955 through 1965 model year light-duty motor vehicle upon initial registration, upon transfer of ownership and registration, or upon registration of a motor vehicle previously registered outside this state, to determine the contribution of that requirement to the maintenance of required ambient air quality standards in those air basins where the requirement is applicable.

(b) In making its determination, the state board shall consider all relevant factors, including, but not limited to, the fact that the requirement is being imposed on a constantly decreasing number of motor vehicles.

(c) Upon a determination by the state board by regulation that the requirement is no longer a significant factor to the maintenance of required ambient air quality standards in any applicable air basin, except as provided in subdivision (d), 1955 through 1965 model year light-duty motor vehicles in that air basin shall no longer be required to be so equipped.

(d) All 1955 through 1965 model year light-duty motor vehicles equipped with an exhaust device pursuant to the requirement prior to the adoption of the regulation by the state board pursuant to subdivision (c) shall continue to be so equipped.

43660. The state board shall review the requirement that every 1966 through 1970 light-duty motor vehicle be equipped with a certified device to control its exhaust emissions of oxides of nitrogen upon initial registration and upon transfer of ownership and registration, to determine the contribution of that requirement to the maintenance of ambient air quality standards in the state and the cost effectiveness of that requirement. The state board shall report to the Legislature its findings and recommendations with regard to the requirement not later than January 1, 1984.

CHAPTER 4. MISCELLANEOUS

Article 1. Low-Emission Motor Vehicles

43800. As used in this article, "low-emission motor vehicle" means a motor vehicle which does not have exhaust emissions of more than 0.3 gram per mile of hydrocarbons, 3 grams per mile of carbon monoxide, and 0.5 gram per mile of oxides of nitrogen.

43801. The Legislature finds and declares that emission of air pollutants from motor vehicles is a major contributor to air pollution within the State of California and, therefore, declares its policy to encourage the development and testing of various types of low-emission motor vehicles, which would contribute substantially to achieving a pure and healthy atmosphere for the people of this state.

43802. Low-emission motor vehicles shall be submitted to the state board for testing to determine if such vehicle meets the standard set forth in Section 43800.

43803. After determining that the low-emission motor vehicle meets the standard set forth in Section 43800, the Department of General Services, in consultation with the state board, shall determine if the low-emission motor vehicle meets all of the following requirements:

(a) The vehicle can be manufactured in sufficient numbers for the purpose of proper evaluation.

(b) The vehicle meets the performance needs for state vehicles.

(c) The cost of the vehicle does not exceed by more than 100 percent the average cost of state passenger vehicles purchased in the preceding fiscal year.

(d) If the vehicle is purchased by the state, there would be a sufficient number of servicing and maintenance outlets.

(e) The average servicing and maintenance costs for the vehicle are comparable to the average servicing and maintenance costs for all other state passenger vehicles. In no event, however, shall the average servicing and maintenance costs for the vehicle exceed the average costs of servicing and maintaining all other state passenger vehicles by more than 50 percent.

43804. If a low-emission motor vehicle meets the requirements of this chapter, and the performance, cost, service, and maintenance requirements adopted by the Department of General Services for such a motor vehicle, and if funds are appropriated for the purpose of purchasing such motor vehicles, the state shall purchase, beginning with the next fiscal year, as many of such low-emission motor vehicles as the Department of General Services determines are reasonable and available to meet state needs.

If a sufficient number of low-emission motor vehicles are available, the percentage of all such motor vehicles to be purchased in that year shall not be less than 25 percent of all motor vehicles purchased by the state in the preceding fiscal year.

43805. The provisions of this chapter shall not apply to the following motor vehicles:

(a) Patrol cars of the Department of the California Highway Patrol.

(b) Any motor vehicle classified as a special-purpose vehicle by the Department of General Services.

Article 2. Fuel System Evaporative Loss Control Devices

43820. The state board shall adopt, by regulation, criteria for the certification of fuel system evaporative loss control devices for installation on motor vehicles not equipped with such a device when first sold. Such criteria shall include, but not be limited to, requirements that the device:

(a) Shall not allow fuel system evaporative loss greater than six grams of hydrocarbons per test.

(b) Shall equal or exceed the performance criteria established by the state board for such new devices required on new motor vehicles or, in the alternative, shall have an expected useful life of at least 50,000 miles of operation.

43821. In adopting criteria for the certification of fuel system evaporative loss control devices, the state board shall take into consideration the cost of the device and its installation, its durability, the ease and facility of determining whether the device, when installed on a motor vehicle, is properly functioning, and any other factors which, in the opinion of the state board, render such a device suitable or unsuitable for the control of motor vehicle air pollution or for the health, safety, and welfare of the public.

43822. Whenever the state board certifies a fuel system evaporative loss control device, pursuant to this article, it shall submit a report of its findings and its recommendations for installation on used vehicles to the Legislature within 10 days, if it is then in session, or if not in session not later than the next January 15.

The report shall include information on the cost of the device, including the cost of installation, and its potential performance, including required maintenance and the cost of labor and parts to perform such maintenance.

43823. The installation of a certified fuel system evaporative loss control device on used motor vehicles shall not be mandated except by statute.

43824. The state board may adopt, by regulation, standards and test procedures for the certification of fuel system evaporative loss control devices on new motor vehicles in the absence of any such federal regulations.

In such case, no new motor vehicle may be sold and registered in this state unless it conforms to such regulations adopted by the state board.

Article 3. Fuel and Fuel Tanks

43830. (a) The state board shall establish, by regulation, maximum standards for the volatility of gasoline at nine pounds per square inch Reid vapor pressure as determined by the American Society for Testing and Materials test D 323-58, or by an appropriate test determined by the state board, for gasoline sold in state.

(b) The state board, in adopting the regulations, shall give full consideration to topography and climatic conditions and may provide that the standards imposed thereby shall apply in those areas which the state board determines necessary in order to carry out the purposes of this division.

(c) Notwithstanding any other law or regulation, until October 1, 1993, any blend of gasoline of at least 10 percent ethyl alcohol shall not result in a violation of any regulation adopted by the state board pursuant to this section unless the volatility of the gasoline used in the blend exceeds the applicable standard of the state board.

(d) For the purposes of this section, "ethyl alcohol" (also known as ethanol) means fuel that meets all of the following requirements:

(1) It is produced from agricultural commodities, renewable resources, or coal.

(2) It is rendered unsuitable for human consumption at the time of its manufacture or immediately thereafter.

(e) For the purposes of determining the percentage of ethyl alcohol contained in gasoline, the volume of alcohol includes the volume of any denaturant approved for that purpose by the United States Bureau of Alcohol, Tobacco and Firearms, provided these denaturants do not exceed 5 percent of the volume of alcohol (including denaturants).

43831. The state board shall establish, by regulation, maximum standards for the degree of unsaturation at a bromine number 30 as established by the American Society for Testing and Materials test D 1159-66, or by an appropriate test determined by the state board, for gasoline sold in the South Coast Air Basin designated by the state board.

The state board, in adopting such regulations, shall give full consideration to climatic conditions and may provide that the maximum standards imposed thereby shall be applicable only during those periods of time which the state board determines necessary in order to carry out the purposes of this division.

43832. The state board may request, from any person who advertises, or causes to be advertised, in any manner a claim that a fuel or fuel additive reduces motor vehicle exhaust emissions, a report detailing the data which supports the advertiser's claims of emission reduction by that fuel or fuel additive.

The state board may conduct, and may request the Department of Consumer Affairs to assist the state board in, such further investigation as may appear warranted under the circumstances.

If the state board, or the state board and the Department of Consumer Affairs if the latter has assisted in the investigation, determines that the fuel or fuel additive is not substantially as effective as it is claimed to be in the advertisement for it, the state board shall report the findings to the Attorney General for whatever action under the Business and Professions Code or other law the Attorney General finds appropriate.

43833. (a) The state board shall establish criteria for the evaluation of the effectiveness of, and may conduct tests respecting the composition or the chemical or physical properties of, any motor vehicle fuel additive sold, or proposed to be sold, in this state. The tests shall be designed to determine whether the additive will reduce or eliminate from vehicular sources any substance found to affect human health or impair the obtainment of the state board's ambient air quality standards, or whether, in specified fuels, a particular fuel additive would result in a significant and beneficial reduction in vehicular emissions commensurate with the purposes of this division and would not have a deleterious effect upon the operation of any vehicle or any motor vehicle pollution control device which is in general use.

(b) The state board may also engage independent laboratories to conduct such tests under test procedures specified by the state board.

(c) Any manufacturer may apply to the state board to have its additive tested pursuant to subdivision (a). The state board may charge an application fee, not to exceed the cost of such tests, for such applications.

43834. (a) The state board shall establish standards or criteria for the certification of auxiliary gasoline fuel tank evaporative loss control devices or systems on vehicles which are required, pursuant to this part or the National Emission Standards Act (42 U.S.C., Secs. 1857f-1 to 1857f-7, inclusive), to be equipped with a fuel system evaporative loss control device to prevent as much evaporation of gasoline into the air from auxiliary fuel tanks as is technologically feasible.

(b) For the purpose of this section, and Section 27156.1 of the Vehicle Code, an "auxiliary gasoline fuel tank" is a fuel tank which is designed and intended by its manufacturer for installation on, or which is installed on, a vehicle operating on gasoline and which is connected to the original fuel system, as defined in Section 39032 of this code, but is not a gasoline fuel tank which is added to a certified device on a used vehicle if such certification included the capability of handling evaporation from such a tank.

43835. (a) The state board shall, by March 1, 1976, adopt specifications for the fill pipes and openings of motor vehicle fuel tanks to ensure that the size, design, and location of the fill pipe and opening permit adequate access to and interfacing with gasoline-dispensing nozzles for the purpose of vapor control.

(b) No new 1977 or later model year gasoline-powered motor vehicle may be sold, offered for sale, or registered in this state unless such vehicle is in compliance with the specifications adopted by the state board pursuant to subdivision (a).

The state board may exempt from such specifications those classifications of motor vehicles for which the state board determines the specifications are technologically infeasible.

The state board also may waive the provisions of this subdivision for any 1977 model year gasoline-powered motor vehicle, provided that the board makes a finding, based upon evidence presented by the manufacturer of such vehicle, that inadequate lead time exists for any required redesign. The state board may make such waiver applicable only to specified body styles of such a vehicle.

43837. (a) The Advisory Board on Air Quality and Fuels is hereby created in state government.

(b) The purposes of the advisory board shall include all of the following:

(1) Provide an independent group of public and private individuals to assemble and evaluate information, and provide judgments and recommendations with regard to the necessity and feasibility of the implementation of methanol-fueled vehicle production and methanol availability mandates.

(2) Examine the technological feasibility and cost effectiveness of the mandated production, sale, and operation of methanol capable and dedicated methanol-fueled vehicles by public and private fleet operators and by the public, and of the phased conversion, expansion, or improvement of the motor vehicle fuel transport, storage, and distribution infrastructure to methanol compatibility, in comparison to other available air quality strategies.

(3) Examine issues related to consumer acceptance of methanol vehicles and the use of methanol fuel, including vehicle performance and durability, fuel and vehicle pricing, vehicle resale, the availability and the convenience of fuel supply and distribution, relative to other control technologies and fuels.

(4) Examine issues related to the economics of methanol production and supply, including anticipated price differentials between methanol, gasoline, and diesel at the wholesale and retail levels, projected methanol production capacity and primary raw materials sources, quantities, and cost, and the impact of methanol substitution on the state's energy security compared to other available options for reducing vulnerability to petroleum supply interruptions and rapid price increases.

(5) Examine the relative environmental and public helath and safety impacts and tradeoffs resulting from the substitution of methanol fuel, compared to other alternative fuels, technologies, and vehicles, including all of the following:

(A) The effect on vehicular and nonvehicular emissions, ambient air quality, and visibility.

(B) Public exposure and environmental contamination from toxic substances associated with fuels, including formaldehyde, benzene, methanol, and gasoline.

(C) Safety and fuel handling and storage issues.

(6) Examine the effectiveness of tax incentives for both industry and consumers and for government purchases of methanol fuel in facilitating the transition to increased use of methanol fuel.

(c) The advisory board shall consist of 17 members, of whom four shall be public members, two appointed by the Senate Committee on Rules, and two appointed by the Speaker of the Assembly. The Governor shall appoint the following 13 members of the commission and designate the chairperson:

(1) The Secretary of Environmental Affairs.

(2) The Secretary of the Business, Transportation and Housing Agency.

(3) The Chairperson of the State Energy Resources Conservation and Development Commission.

(4) The chairperson of the south coast district and a representative from a district in a nonattainment area.

(5) Three representatives of the California petroleum fuel industry.

(6) One representative of the methanol industry.

(7) Two representatives of the domestic motor vehicle manufacturing industry, one of whom shall represent manufacturers of heavy-duty vehicles or engines.

(8) One representative of the imported motor vehicle manufacturing industry.

(9) The Director of Food and Agriculture.

The advisory board may appoint additional ex officio members.

(d) The advisory board may select an executive director, approve study protocols, let contracts, including selection of contractors, and conduct public hearings.

(e) The chairperson of the advisory board may oversee the day-to-day operations of the advisory board, chair meetings, appoint a vice chairperson, appoint special task forces as necessary, establish the agenda, and schedule meetings.

(f) The advisory board may request assistance from the state board, the State Energy Resources Conservation and Development Commission, the south coast district, or other public bodies for administrative services and staff support, and these agencies may provide these services, to the extent they determine is feasible, within existing budgetary resources. The advisory board may solicit funds from other public or private sources, and may accept private and public in-kind contributions, including technical and professional support, to accomplish the purposes of this chapter. The advisory board shall report on the sources and amounts of funds or contributions received.

(g) This section shall remain in effect only until January 1, 1993, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 1993, deletes or extends that date.

43838. (a) Not later than one year after the appointment of its members, the Advisory Board on Air Quality and Fuels shall submit a report to the Legislature which includes its findings and recommendations with respect to the environmental and economic impacts and feasibility of the implementation of methanol-fueled vehicle production and methanol availability mandates.

(b) Nothing in Section 43837 or this section limits the existing authority of the state board, any district, or the State Energy Resources Conservation and Development Commission to adopt regulations relating to low-emission vehicles or low-emission fuels.

(c) This section shall remain in effect only until January 1, 1993, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 1993, deletes or extends that date.

ARTICLE 4. Alcohol Fueled Motor Vehicles

43840. (a) The Legislature finds and declares that emission of air pollutants from motor vehicles is a major contributor to air pollution within the State of California and, therefore, declares its policy to encourage the testing of various types of vehicle fuels, which would contribute substantially to the protection and preservation of the public health and well-being.

(b) The Legislature further finds and declares that programs to expand the use of alcohols as substitutes for gasoline and other petroleum-based fuels can offer significant environmental benefits while reducing the nation's dependence on imported crude oil.

(c) The Legislature further finds and declares that pure alcohol fuels burn cleanly and that motor vehicles fueled with alcohol can be modified at reasonable cost to burn alcohol fuels without decreasing efficiency and without creating air quality problems.

(d) It is, therefore, the intent and purpose of the Legislature, to authorize the establishment of a demonstration program in the County of Ventura for the testing of pure alcohol fuels in the county and municipal motor vehicle fleets.

43841. The Secretary of the Business and Transportation Agency shall reimburse the County of Ventura from funds appropriated for alternative motor vehicle fuels for the cost of conversion of fleet vehicles provided that the state board finds both of the following:

(a) All changes to the vehicles are absolutely necessary for the vehicles to operate on pure alcohol.

(b) The fuel systems of the motor vehicles have been certified pursuant to Section 43006.

43841.5. The Secretary of the Business and Transportation Agency shall make the reimbursement pursuant to Section 43841 only in the event the County of Los Angeles and the California Energy Commission fail to reach an agreement, on or before December 31, 1980, to conduct a demonstration program similar to that provided in this article, as determined by the secretary, for the testing of alcohol fuels. If the County of Los Angeles and the State Energy Resources Conservation and Development Commission do reach such an agreement by December 31, 1980, no reimbursement shall be made pursuant to this article.

43843. (a) The state board, in consultation with the State Energy Resources Conservation and Development Commission, shall establish and conduct, until January 1, 1988, an experimental program in which fleet vechiles may utilize gasoline into which methanol has been blended.

(b) In order to participate in the methanol-gasoline experimental vehicle fleet program, all of the following information shall be submitted to the state board for each vehicle proposed for participation in the program:

(1) The make, model, vehicle identification number, and license number of each vehicle.

(2) A description of the fuel to be used in the vehicle.

(3) Evidence that the vehicle's emissions using the methanol-gasoline blend will be no higher than the vehicle's emissions using gasoline which complies with the volatility standard established pursuant to Section 43830. Evidence may be based on emission tests or a combination of emission tests and engineering evaluation.

(4) A description of any modifications to the vehicle necessary to comply with paragraph (3).

(5) A valid certificate of compliance issued pursuant to Section 4000.1, 4000.2, or 4000.3 of the Vehicle Code.

(c) Within 60 days of receipt of a request to participate in the program, the state board, in consultation with the State Energy Resources Conservation and Development Commission, shall approve or deny the request. Approval shall be granted if adequate evidence is provided that use of the fuel will not cause or contribute to an increase in vehicle emissions when using the methanol-gasoline blend.

(d) The state board may periodically test vehicles enrolled in the program for compliance. Failure to meet state emission standards shall not result in imposition of any fine or penalty if there are no violations of Section 27156 of the Vehicle Code, and the vehicle is restored to conform to applicable emission standards at the end of the experimental program.

(e) All of the following records shall be maintained on each vehicle and shall be made available to the state board upon request:

(1) Fuel economy.

(2) Maintenance and repair.

(3) Driveability.

(f) The state board may exempt the vehicles in any fleet participating in the program from the requirements of subdivision (b) until July 1, 1985. The exemption shall be granted if the applicant demonstrates that the evidence required pursuant to paragraph (3) of subdivision (b) is not available, that there is likelihood that it will become available within the exemption period, and that the facility at which the fleet vehicle is normally refueled does not have provisions for the distribution of more than one type of fuel.

43844. Fuels used in vehicles participating in the methanol-gasoline experimental vehicle fleet program shall not be required to comply with the standards established pursuant to Section 43830 or the requirements of subdivision (b) of Section 13440 of the Business and Professions Code, if all of the following conditions are met:

(a) The fuel is dispensed only from a pump operated by a fleet operator whose request to participate has been granted pursuant to subdivision (c) of Section 43843.

(b) The fuel is used only in vehicles participating in the methanol-gasoline experimental vehicle fleet program.

(c) The gasoline used in the blend meets the standards established pursuant to Section 43830.

CHAPTER 5. MOTOR VEHICLE INSPECTION PROGRAM

Article 1. General

44000. (a) The Legislature finds and declares as follows:

(1) Motor vehicle inspection and maintenance programs can significantly reduce vehicle emissions and thereby contribute to the attainment and maintenance of ambient air quality standards.

(2) The effectiveness of motor vehicle inspection and maintenance programs depends on effective monitoring and enforcement of program requirements.

(3) The complexity of vehicle emission control systems has increased to the extent that it is necessary for the qualifications of inspectors and the capabilities of test equipment to be improved.

(4) Organizational changes to achieve more effective coordination between the new motor vehicle emission control program and the motor vehicle inspection and maintenance program will enhance the effectiveness of both programs.

(5) Emission reductions due to motor vehicle inspection and maintenance programs can be substantially increased through the implementation of more effective inspection and repair requirements.

(6) Air pollution problems in many areas of the state are of such severity and persistence that all reasonable motor vehicle air pollution control measures will be required for the indefinite future.

(b) It is, therefore, the intent of the Legislature in adopting amendments to this chapter in 1988 to establish a more effective motor vehicle inspection and maintenance program as a continuing element of the state's vehicular air pollution control program.

44001. This chapter shall remain in effect only until January 1, 1999, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 1999, deletes or extends that date.

44001.5. (a) There is in the Department of Consumer Affairs a Bureau of Automotive Repair under the supervision and control of the director. A duty of enforcing and administering this chapter is vested in the chief of the bureau who is responsible to the director.

(b) The department shall take those actions consistent with its statutory authority to ensure that the reduction in emission of hydrocarbons and carbon monoxide is 25 percent or more, and the reduction in emissions of oxides of nitrogen is 10 percent or more, than would have occurred without a motor vehicle inspection program. The department shall endeavor to achieve these emission reductions as expeditiously as practicable, but not later than January 1, 1994.

(c) In areas of the state where testing for oxides of nitrogen emissions is conducted pursuant to subdivision (b) of Section 44003, the department shall take all actions to ensure that the reduction in emissions of hydrocarbons is 40 percent or more, the reduction in carbon monoxide is 25 percent or more, and the reduction in oxides of nitrogen is 20 percent or more, than would have occurred without the amendments to this chapter enacted in 1988. The department shall endeavor to achieve these reductions as expeditiously as practicable, but not later than four years after the commencement of testing for oxides of nitrogen emissions pursuant to subdivision (b) of Section 44003.

44002. The department shall have the sole and exclusive authority within the state for developing and implementing the motor vehicle inspection program in accordance with this chapter.

For the purposes of administration and enforcement of this chapter, the department, and the director and officers and employees thereof, shall have all the powers and authority granted under Chapter 20.3 (commencing with Section 9880) of Division 3 of the Business and Profession Code and under Chapter 33 (commencing with Section 3300) of Title 16 of the California Administrative Code. Inspections and repairs performed pursuant to this chapter, in addition to meeting the specific requirements imposed by this chapter, shall also comply with all requirements imposed pursuant to Chapter 20.3 (commencing with Section 9880) of Division 3 of the Business and Professions Code and Chapter 33 (commencing with Section 3300) of Title 16 of the California Administrative Code.

44003. (a) Any district may request the department to implement within its area of jurisdiction a motor vehicle inspection program which meets the requirements of this chapter. The area subject to the program shall include the entire standard metropolitan statistical area in which any violation of ambient air quality standards related to motor vehicle emissions exists and any other areas within the district specified by the requesting district or determined by the state board, in consultation with the districts, to contribute to violations of the ozone or carbon monoxide air quality standards in the district or in an adjacent district.

(b) At the time of the initial request pursuant to subdivision (a), or at any time thereafter, testing for oxides of nitrogen emissions shall be included at the option of the district requesting the program or upon a determination by the state board, after a hearing held within the district, that testing for oxides of nitrogen emissions will contribute to improved air quality.

(c) If testing for oxides of nitrogen emissions is requested pursuant to subdivision (b), the department shall implement a testing program within the district as soon as the department can develop a procedure for testing for oxides of nitrogen emissions that will be feasible and more effective than the testing program existing in 1988. The implementation date for testing for oxides of nitrogen emissions shall be the earliest date which provides sufficient lead time for the development, production, and installation of testing equipment. The department shall endeavor to implement testing within two years of the district's request. If the department determines that more time is required, the department shall provide the district with a detailed implementation schedule and shall periodically report to the district on the progress being made to implement testing.

44003.5. (a) Any district that is not, or does not contain, a federally designated nonattainment area, but desires to utilize a motor vehicle inspection program meeting the requirements of this chapter as an air pollution control strategy, may request the department to implement the program within the district if the requesting district finds, and the department concurs in, booth of the following:

(1) The requesting district adjoins a district that has a motor vehicle inspection program.

(2) The adjoining district is the regular destination of a significant number, as

determined by the department, of commuter trips which originate in the requesting district and which contribute a significant amount, as determined by the department, of pollutants from motor vehicles.

(b) The area of the district to be included in the program shall be specified by the requesting district.

44004. (a) The motor vehicle inspection program provided by this chapter, when implemented in a district, shall supersede and replace any other program for motor vehicle emission inspection in the district.

However, this chapter shall not apply to any vehicle permanently located on an island in the Pacific Ocean located 20 miles or more from the mainland coast.

(b) The motor vehicle inspection program provided by this chapter shall be in accordance with Sections 4000.1, 4000.2, and 4000.3 of the Vehicle Code.

44005. The department, with the cooperation of the Department of Motor Vehicles, shall implement the motor vehicle inspection program provided for by this chapter consisting of a testing portion, a repair portion, and a consumer protection-oriented quality assurance portion, in accordance with the requirements of this chapter.

The program shall provide for inspection of motor vehicles upon initial registration, biennially upon renewal of registration, and upon transfer of ownership.

44006. [Repealed]

Article 2. Program Requirements

44010. The motor vehicle inspection program shall provide for privately operated stations which shall be referred to as smog check stations and are authorized to issue certificates of compliance or noncompliance to vehicles which meet the requirements of this chapter.

44011. All motor vehicles powered by internal combustion engines which are registered within an nonattainment area designated for program coverage shall be required biennially to obtain a certificate of compliance or noncompliance, except for all of the following:

(a) Every motorcycle, every vehicle powered by liquid petroleum gas which is not part of a fleet of 15 or more vehicles, and every diesel-powered vehicle, until the department determines that the inclusion of those vehicles is technologically and economically feasible.

(b) Any motor vehicle which has been issued a certificate of compliance or noncompliance or a waiver upon a change of ownership or initial registration in this state during the proceeding 12 months.

(c) Any motor vehicle manufactured prior to the 1966 model-year.

(d) Any other vehicle which the department determines would present prohibitive inspection or repair problems.

(e) Any vehicle registered to the owner of a fleet licensed pursuant to Section 44020 if the vehicle is garaged exclusively outside the area included within the program.

(f) Those motor vehicles subject to the program consisting of 1971 and earlier model-years as a group, 1972 to 1974, inclusive, model-years as a group, and 1975 to 1979, inclusive, model-years as a group for which the state board determines that the emission reductions for a single group, on an individual pollutant basis, are less than 2 percent of the total emission reductions achieved by the program.

44011.5. Documentation that a motor vehicle is exempt from the requirements of Section 44011 may not be based solely on the owner's statement that the vehicle is in an exempt category. Physical inspection of the vehicle by the department is required unless alternative documentation satisfactory to the department is available.

44011.6. (a) As expeditiously as possible, the state board shall develop a test procedure for the detection of excessive smoke emissions from heavy-duty diesel motor vehicles that is feasible for use in an intermittent roadside inspection program. During the development of the test procedure, the state board shall cooperate with the Department of the California Highway Patrol in conducting roadside inspections. The state board may also specify visual or functional inspection procedures to determine the presence of tampering or defective emissions control systems in heavy-duty diesel or heavy-duty gasoline motor vehicles. The chairperson of the state board shall appoint an ad hoc advisory committee which shall include, but not be limited to, representatives of heavy-duty engine manufacturers, carriers of property for compensation using heavy-duty gasoline or diesel motor vehicles, and the Department of the California Highway Patrol. The advisory committee shall cooperate with the state board to develop a test procedure pursuant to this subdivision and shall advise the state board in developing regulations to implement test procedures and inspection of heavy-duty commercial motor vehicles.

(b) The state board shall, by regulation, prohibit the use of heavy-duty motor vehicles which are determined to have excessive smoke emissions or other emissions-related defects, using the test procedure established pursuant to subdivision (a). However, visual or functional inspection procedures for heavy-duty gasoline vehicles shall not be more stringent than those prescribed by the department for heavy-duty gasoline vehicles subject to biennial inspection pursuant to Section 44013. The state board may issue a citation to the owner or operator for any vehicle in violation of regulations adopted under this subdivision. These regulations may require the operator of a vehicle to submit to a test procedure adopted pursuant to subdivision (a), may specify that refusal to so submit is a violation of the regulations and shall require that, when a citation has been issued, the owner of a vehicle in violation of the regulations shall immediately correct every deficiency specified in the citation.

(c) The department may develop criteria for one or more classes of smog check stations capable of determining compliance with regulations adopted pursuant to subdivision (b) and may authorize those stations to issue certificates of compliance to vehicles in compliance with the regulations. The department may contract for the operation of smog check stations for heavy-duty vehicles pursuant to this subdivision, and only heavy-duty vehicles may be inspected at these stations.

(d) In addition to the corrective action required by subdivision (b), the owner of the motor vehicle in violation of the regulations adopted pursuant to subdivision (b) is subject to a civil penalty of not more than one thousand five hundred dollars ($1,500) per day for each day that the vehicle is in violation. The state board may adopt a schedule of reduced civil penalties to be applied in cases where violations are corrected in an expeditious manner. The schedule of reduced civil penalties shall not, however, apply where there have been repeated incidents of emissions control system tampering. All civil penalties imposed pursuant to this section shall be collected by the state board and deposited in the Vehicle Inspection and Repair Fund. Funds in the Vehicle Inspection and Repair Fund shall, when appropriated by the Legislature, be available to the state board and the Department of the California Highway Patrol for the conduct of intermittent roadside inspections of heavy-duty vehicles pursuant to this section.

(e) Following the adoption of regulations pursuant to subdivision (b), the state board and the Department of the California Highway Patrol shall commence inspecting heavy-duty motor vehicles. With the concurrence of the Department of the California Highway Patrol, these inspections may be conducted in conjunction with the safety and weight enforcement activities of the Department of the California Highway Patrol or at other locations selected by the state board or the Department of the California Highway Patrol. Inspection locations may include private facilities where fleet vehicles are serviced or maintained. The state board and the Department of the California Highway Patrol may conduct these inspections either cooperatively or independently, and the state board may contract for assistance in the conduct of these inspections.

(f) The state board shall inform the Department of the California Highway Patrol whenever a vehicle owner cited pursuant to subdivision (b) fails to take a required corrective action or to pay the civil penalty levied pursuant to subdivision (d) in a timely manner, and the Department of the California Highway Patrol may, upon receipt of that information, require that the vehicle be removed from service until the civil penalty is paid and the corrective action taken.

(g) The state board, in consultation with the Department of the California Highway Patrol, shall, within two years of the adoption of regulations pursuant to subdivision (b), prepare and submit to the Legislature a report on the smoke emissions enforcement program conducted under this section, including, but not limited to, its assessment of the effectiveness of the program, the impact of the program on the operations of the Department of the California Highway Patrol, and its recommendations for changes in, alternatives to, or termination of, the program.

44012. The test at the smog check stations shall include all of the following:

(a) A determination that emission control devices and systems required by state and federal law are installed and functioning correctly in accordance with the test procedure adopted pursuant to subdivision (b) of Section 44013.

(b) A preconditioning of the motor vehicle to ensure representative and stabilized operation of the vehicle's emission control system.

(c) For other than diesel-powered vehicles, a test of the vehicle's exhaust emissions of hydrocarbons, carbon monoxide, and carbon dioxide in an idle mode or loaded mode in accordance with the procedure prescribed by the department. Testing for oxides of nitrogen emissions shall be included if the district has requested testing for oxides of nitrogen and the department has implemented a testing program pursuant to Section 44003.

(d) For diesel-powered vehicles when the department determines that the inclusion of those vehicles is technologically and economically feasible, a test of the vehicle's exhaust emissions in an idle mode or loaded mode in accordance with the procedure prescribed by the department. The test may include testing of emissions of any or all of the pollutants specified in subdivision (b) and, upon the adoption of applicable standards, measurement of emissions of smoke or particulates, or both.

(e) A determination as to whether the motor vehicle complies with the emission standards for that vehicle's class and model-year as prescribed by the department.

44013. (a) The department, in cooperation with the state board, shall prescribe maximum emission standards to be applied in inspecting motor vehicles under this chapter.

In prescribing the standards, the department shall undertake studies and experiments which are necessary and feasible, evaluate available data, and confer with automotive engineers.

The standards shall be set at a level reasonably achievable for each class and model of motor vehicle when operating in a reasonably sound mechanical condition, allowing for the effects of installed motor vehicle pollution control devices and the motor vehicle's age and total mileage. The standards shall be designed so that motor vehicles will be operated, as soon as possible, with a substantial reduction in emissions, and shall be revised from time to time as experience justifies.

(b) The department, in cooperation with the state board, shall research and prescribe test procedures to be applied in inspecting motor vehicles under this chapter, which procedures shall be simple, cost effective, and consistent with the requirements of section 44012. The department may revise the test procedures from time to time as experience justifies. To the extent that any test procedure revision requires new equipment, or a change in equipment, at licensed smog check stations, the department shall provide a reasonable period of time for the acquisition and installation of that new or changed equipment.

(c) Notwithstanding any other provision of this chapter, the maximum emission standards and test procedures prescribed in subdivisions (a) and (b) for a motor vehicle class and model-year shall not be more stringent than the emission standards and test procedures under which that motor vehicle's class and model-year was certified. Emission standards and test procedures prescribed by the department shall ensure that not more than 5 percent of the vehicles or engines, which would otherwise meet the requirements of this part, will fail the inspection and maintenance test for that class of vehicle or engine.

44014. (a) The testing and repair portion of the program shall be conducted by smog check stations licensed by the department, and by smog check mechanics who have qualified pursuant to this chapter, if the repairs are performed for compensation.

(b) A smog check station may be licensed by the department as a smog check test only station and, when so licensed, need not comply with the requirement for onsite availability of current service and adjustment procedures specified in paragraph (3) of subdivision (b) of Section 44030. A smog check mechanic employed by a smog check test only station shall be qualified in accordance with this section.

(c) Smog check mechanics are qualified to test and repair only those classes and categories of vehicles for which they have passed a qualification test administered by the department. The department shall provide for smog check mechanics to be qualified for different categories of motor vehicle inspection based on vehicle classification and model-year.

(d) The consumer protection-oriented quality assurance portion of the program, shall be conducted by more than one private entity pursuant to contracts with the department.

44015. (a) A licensed smog check station shall not issue a certificate of compliance or noncompliance for a motor vehicle which does not meet the requirement of Section 44012.

(b) If a vehicle meets the requirements of Section 44012, a licensed smog check station shall issue a certificate of compliance or a certificate of noncompliance. The certificate shall be signed by a licensed inspector.

(c) A certificate of compliance or noncompliance may be issued by the department or a referee facility when it is determined that no adjustment or repair can be made that will reduce emissions from the inspected motor vehicle without exceeding the cost limitation established by the department, and that every defect specified by paragraph (2) of subdivision (a) of Section 43204, and by paragraphs (2) and (3) of subdivision (a) and paragraph (2) of subdivision (b) of Section 43205, have been corrected.

(d) A certificate of compliance or noncompliance shall be valid for 90 days.

(e) A test may be made at any time within three months prior to the date otherwise required.

44016. The department shall, with the cooperation of the state board and after consultation with the motor vehicle manufacturers and representatives of the service industry, research, establish, and update as necessary, specifications and procedures for motor vehicle maintenance and tuneup procedures and for repair of motor vehicle pollution control devices and systems. Licensed repair stations and qualified mechanics shall perform all repairs in accordance with specifications and procedures so established.

44017. (a) The department shall set cost limitations for repairs required under the program, including parts and labor. On or after January 1, 1990, the cost limitations shall be as follows:

(1) For motor vehicles of 1971 and earlier model-years, fifty dollars ($50).

(2) For motor vehicles of 1972 to 1974, inclusive, model-years, ninety dollars ($90).

(3) For motor vehicles of 1975 to 1979, inclusive, model-years, one hundred twenty-five dollars ($125).

(4) For motor vehicles of 1980 to 1989, inclusive, model-years, one hundred seventy-five dollars ($175).

(5) For motor vehicles of 1990 and later model-years, three hundred dollars ($300).

(b) The department shall periodically revise the cost limitations specified in subdivision (a) in accordance with changes in the Consumer Price Index, as published by the United States Bureau of Labor Statistics. No limit shall be imposed in those cases where emissions control equipment is missing or is partially or totally inoperative as a result of tampering.

(c) The review committee established pursuant to section 44021 shall prepare and submit to the Legislature on or before January 1, 1992, a report on the effect of the cost limitations established in subdivision (a) on reductions in air pollution accomplished pursuant to this chapter and on the extent of compliance with motor vehicle registration laws.

44018. (a) The motor vehicle inspection program may include advisory safety equipment maintenance checks, fuel efficiency checks, or both, on the motor vehicle if the department finds that cost-effective methods for conducting those checks exist and that the cost of the inspection to the vehicle owner due to the additional checks would not be increased by more than 10 percent. The department shall specify the equipment to be checked and the procedures for conducting those checks.

(b) Notwithstanding subdivision (a), a motor vehicle sold at retail by a lessor-dealer licensed pursuant to Chapter 3.5 (commencing with Section 11600), or a dealer licensed pursuant to Chapter 4 (commencing with Section 11700), of Division 5 of the Vehicle Code shall not be subject to an advisory safety equipment maintenance check pursuant to this section.

44019. (a) Every public agency, including, but not limited to, a publicly owned public utility, owning or operating any motor vehicle that is exempt from annual renewal of registration, and is otherwise subject to this chapter, shall obtain for the vehicle a certificate of compliance with the same frequency as is required for vehicles subject to renewal of registration. The cost limitations specified in Section 44107 do not apply to any vehicle owned or operated by a public agency.

(b) Certificates of compliance required by subdivision (a) shall be issued after a test of the motor vehicle utilizing a test analyzer system meeting the requirements of Section 44036. Any certificate so issued shall be indexed by vehicle license plate number or vehicle identification number and retained by the public agency for not less than three years, and shall be available for inspection by the department.

(c) Every public agency subject to subdivision (a) shall annually report to the department the number of certificates issued, the number of motor vehicles owned, and the schedule under which the motor vehicles were issued certificates of compliance.

(d) The department may accept proof of compliance with this section other than by a certificate of compliance.

44020. Notwithstanding any other provision of this chapter, the department may license any owner of a fleet of 15 or more motor vehicles subject to this chapter, who so elects, to implement and conduct the tests and a perform necessary service and adjustment on the fleet's vehicles under this chapter, subject to all of the following conditions:

(a) The owner's facilities or personnel, or both, or a designated contractor of the owner, shall be certified by the department, and the test and repair system shall conform, in the department's determination, with all provisions of this chapter and all rules and regulations adopted by the department. The regulations shall provide for adequate onsite inspection by the department.

(b) A license issued under this section shall be suspended or rescinded by the department whenever the department determines, on the basis of random spot checks of the owner's inspection system and fleet vehicles, that the system fails to conform or that certificates of compliance have been issued by the owner in violation of regulations adopted by the department. Any person licensed to conduct tests and service and adjustments under this section is deemed to have consented to provide the department with whatever access, information, and other cooperation the department reasonably determines are necessary to facilitate the random spot checks.

(c) A fleet owner authorized to conduct tests or make repairs pursuant to this chapter shall issue certificates of compliance for motor vehicles which comply with the reqirements of this chapter. The cost limitations in Section 44017 shall not apply to any motor vehicle owned by a fleet owner licensed pursuant to this section.

44021. (a) The department shall conduct ongoing cost benefit analyses and other evaluations of the motor vehicle inspection program, including, but not limited to, observed patterns of malfunctions in inspected motor vehicles' emissions control system, inquiries from public regarding emissions system warranties, inspection and repair costs, the failure rate after repairs, and recommendations for legislation to improve the inspection program.

The department shall prepare and submit an annual report to the Legislature on the analyses and evaluations of the program. The department shall conduct at least one public hearing prior to submitting each report and shall include pertinent information which it receives from the public hearing in that report.

Commencing in 1989, and every year thereafter, the department shall include the following information in its annual report:

(1) A narrative description of what actions have been taken by the department, since the last report, to implement recommendations contained in the reports of the review committee submitted pursuant to subdivision (b). The description shall identify the funds expended to implement the recommendations, the sources of those funds, and how those funds and sources have changed since the department's last report.

(2) A quantitative assessment of the impact of these actions, since the last report, on all of the following:

(A) The waiver rate.

(B) The percentage of all inspections performed pursuant to subdivision (a) of Section 44012 which were incorrectly or incompletely performed.

(C) The percentage of repairs to emission control devices and systems which were incorrectly or incompletely performed.

(D) The percentage of enforcement investigations which result in issuance of a citation or imposition of any other penalty.

(3) An identification and assessment of whether any additional actions or funds are required to achieve any specific performance or emission reduction objectives identified in the review committee report.

The department shall provide the review committee and the state board an opportunity to comment on the draft annual report prepared under this subdivision, and any written comments of the state board or the review committee shall be included in the final report submitted to the Legislature.

(b) A review committee is hereby created to analyze the effect of the program on motor vehicle emissions and air quality. The review committee shall consist of a representative from the state board and a representative from each of the districts in which the motor vehicle inspection program has been implemented.

(1) The committee shall elect one of its members as its chairperson. The members of the committee shall receive no compensation, but shall be reimbursed by the department for their actual and necessary expenses in performing committee duties. The state board and the department shall provide the committee the necessary technical and clerical support in its evaluation of program effectiveness.

2. The committee shall schedule and conduct periodic meetings in the performance of its duties, and shall meet and consult with local, state, and federal officials involved in the evaluation of motor vehicle inspection and maintenance programs.

(c) The committee shall conduct at least one public hearing prior to submitting its report to the Legislature and shall include pertinent information which it receives from the public hearings in its report. The first report shall be submitted not later than 36 months following the implementation of the program. Thereafter, the committee shall submit periodic written reports to the Legislature on the program at least every 24 months. The committee's reports shall quantify the reduction in emissions and improvement in air quality attributed to the program.

(d) In those areas where testing for oxides of nitrogen emissions has not been implemented, the committee shall determine whether the average emissions of hydrocarbons and carbon monoxide from inspected vehicles is at least 35 percent less than the average of those emissions without the program.

(e) In those areas where testing for oxides of nitrogen emissions has been implemented, the committee shall determine whether the average emissions from inspected motor vehicles is at least 40 percent less for hydrocarbons, at least 25 percent less for carbon monoxide, and at least 20 percent less for oxides of nitrogen, than the average of those emissions without the program. If the committee determines that the average percentage reduction in emissions from inspected motor vehicles is less than the percentages specified in subdivision (d) or (e), as the case may be, the report shall include specific recommendations for improving the emissions reduction effectiveness and administration of the program. Where possible, specific recommendations shall include quantitative performance objectives which the committee has determined are reasonably achievable and which are based on the program's achieving the maximum emissions reduction. The department shall take all feasible actions to implement the committee's recommendations as expeditiously as practical.

44022. (a) On and after January 1, 1990, no license issued to an official motor vehicle pollution control device installation and inspection station or to a motor vehicle pollution control device installer under Section 9887.1 of the Business and Professions Code shall be valid. On and after that date, every such station and installer shall be licensed under this chapter.

(b) The department may specify requirements for emission tests analyzers that are different from the requirements contained in subdivision (b) of Section 44036.

Article 3. Quality Assurance

44030. (a) The department shall develop standards for the licensing of smog check stations. Tests, service, and adjustment at smog check stations shall be performed by a qualified smog check mechanic.

(b) The licensing standards for smog check stations may include, but are not limited to, requirements for all of the following:

(1) Use of computerized and tamper-resistant testing equipment, including, but not limited to, test analyzer systems meeting the current requirements of the department.

(2) Annual license renewal.

(3) Onsite availability of current emission control system information and service and adjustment procedures.

44030.5. The department shall develop standards for certification of institutions and instructors for purposes of providing prerequisite training of smog check mechanics. The standards shall include criteria for applications, manuals, textbooks, laboratory equipment, laboratory exercise, hands-on work, examinations, and other matters the department determines necessary for a certified course of instruction.

The standards shall also specify the conditions under which an institution or instructor may be decertified, and under which a decertified institution or instructor may regain certification.

44031. (a) The owner of manager of every licensed smog check station shall be a licensed inspector.

(b) Every licensed inspector either shall have completed training courses meeting the standards developed under Section 44031.5 or shall be a qualified smog check mechanic.

(c) The license of a licensed inspector shall be issued for a period of two years, commencing January 1, 1988, and is subject to renewal every two years thereafter. The department shall establish initial and renewal license fees, which shall not exceed the reasonable costs of administering the licensed inspector program.

44031.5 (a) No smog check mechanic may perform tests or make repairs required by this chapter, for compensation, unless qualified by the department for the class and category of vehicle being tested or repaired.

(b) No person may perform the duties of a licensed inspector, including, but not limited to, the signing of certificates, unless that person is licensed and has met the requirements of subdivision (b) of Section 44031. This subdivision applies to every licensed inspector upon the first renewal of the inspector's license after January 1, 1988, and upon each renewal thereafter.

(c) The department shall prescribe training and periodic retraining courses for licensed inspectors and for smog check mechanics.

(d) Whenever the department determines, through investigation, that a previously qualified smog check mechanic may lack the skills to reliably and accurately perform the test or repair functions within the required qualification, it may prescribe for the mechanic one or more retraining courses which have been certified by the department. The smog check mechanic may request and be granted a hearing, pursuant to Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code, on the department's determination. The request for a hearing shall be submitted within 30 days of the department's notification of its determination. A failure to complete the prescribed retraining course within the time designated by the department, or to request a hearing within 30 days of the department's notification of its determination, shall result in loss of qualification. Upon a later completion of the prescribed department certified retraining course, the department may reinstate the smog check mechanic's qualification.

(e) Smog check mechanics shall have the option to do hands-on work in lieu of written work in order to successfully complete the department certified training and retraining courses. The institution administering the department certified training or retraining courses shall issue a certificate of completion to each person successfully completing the certified courses. The certificate shall be valid for two years.

(f) There is hereby created a training course advisory board to assist and advise the department in recommending the form and content of training courses. The advisory board shall consist of five members appointed by the director, of whom two shall represent smog check station owners or managers, two shall represent smog check mechanics, and one shall be a public member. The members of the advisory board shall receive no compensation for their services, but shall be reimbursed for their actual and necessary expenses in performing their duties under this subdivision.

44032. No person shall perform, for compensation, tests or repairs of emission control devices or system of motor vehicles required by this chapter unless the person performing the test or repair is a qualified smog check mechanic and the test or repair is performed at a licensed smog check station. Qualified mechanics shall perfome tests of emission control devices and systems in accordance with Section 44012.

44033. (a) Any facility meeting the requirements established by the department pursuant to this chapter may be licensed as a smog check station. A licensed smog check station shall display an identifying sign prescribed by the department in a manner conspicuous to the public.

(b) No licensed smog check station shall require, as a condition of performing the test, that any needed repairs or adjustment be done by the person, or at the facility of the person, performing the test.

(c) If a motor vehicle is tested at a facility licensed to perform tests and repairs pursuant to this chapter, the facility shall provide the customer with a written estimate pursuant to Section 9884.9 of the Business and Professions Code. The written estimate shall contain a notice to the customer stating that the customer may choose another smog check station to perform needed repairs, installations, adjustments, or subsequent tests.

(d) Charges for testing or repair, or both, shall be separately stated.

(e) The department shall require the posting of station licenses, inspector licenses, and qualified mechanics certificates prominently in each place of business so as to be readily visable to the public.

44034. Annual license fees for smog check stations and smog check mechanics may be imposed by the department, but shall not exceed the reasonable cost of administering the qualifications and licensing program.

44035. A smog check station's license, an inspector's license, or a qualified smog check mechanic's qualification may be suspended or revoked by the department, after a hearing, for failure to meet or maintain the standards prescribed for qualification, equipment, performance, or conduct. The department shall adopt rules and regulations governing the suspension, revocation, and reinstatement of licenses and qualifications and the conduct of the hearings.

44036. (a) The consumer protection-oriented quality assurance portion of the motor vehicle inspection program shall ensure uniform and consistent tests and repairs by all qualified smog check mechanics and licensed smog check stations throughout the district, and shall include a number of referee stations available to consumers. Sufficient referee stations shall be provided to accommodate at least 2 percent of the motor vehicles subject to the requirements of this chapter.

(b) All licensed smog check stations shall utilize equipment which has been certified by the department. The department shall adopt and may from time to time revise, standards for certification of the equipment, which may include a device for testing of emissions of oxides of nitrogen. As expeditiously as possible, the department shall adopt equipment standards which shall include a test analyzer system containing all of the following:

(1) A microprocessor to control test sequencing, selection of proper test standards, the automatic pass of fail decision, and the format for the test report and the recorded data file. The microprocessor shall be capable of using a standardized programming language specified by the department.

(2) An exhaust gas analysis portion with an analyzer for hydrocarbons, carbon monoxide, and carbon dioxide which is designed to accommodate an optional oxides of nitrogen analyzer.

(3) A device to accept and record motor vehicle identification information, including a device capable of reading bar code information affixed to vehicles pursuant to regulations of the state board.

(4) A device to provide a printed record of the test process and diagnostic information for the motorist.

(5) A device capable of measuring engine speed from all models of vehicles using spark ignition at the time the specification is adopted by the department.

(6) A mass storage device capable of storing not less than the minimum amount of program software and data specified by the department.

(7) A device to provide for the periodic modification of all program and data files contained on the mass storage device, using a standardized form of removable media conforming to specifications of the department.

(8) A device which provides for the storage of test records on a standardized form of removable media conforming to specifications of the department.

(9) One or more communications ports conforming to the specifications established by the department.

(10) An interface capable of monitoring equipment used with loaded mode testing.

(11) Any other features that the department determines will increase the effectiveness of the program.

(c) The department shall require all smog check stations to use equipment meeting the requirements of subdivision (b) as soon as possible after July 1, 1990, but not later than January 1, 1992. Prior to a requirement for equipment meeting the requirements of subdivision (b), every smog check station shall use equipment meeting the specifications of the department in effect on January 1, 1988. Any equipment required may be supplied by a single supplier in any nonattainment area if it is determined that there would be a demonstrable cost savings as shown through the solicitation and evaluation of competitive bids for each nonattainment area. If it is determined that any equipment required shall be supplied by a single supplier, the supplier shall enter into a master agreement with the department specifying the prices, terms, and conditions under which the supplier will provide equipment in a uniform manner within the nonattainment area. The master agreement shall contain terms consistent with the bid upon which it is based.

(d) The quality assurance portion shall provide for inspections of licensed smog check stations, data collection and forwarding, equipment accuracy checks, operation of referee stations, and other necessary functions. In contracting for service pursuant to subdivision (d) of Section 44014, the department shall prepare detailed specifications and solicit bids from private entities for the implementation of the quality assurance functions.

(e) The department may revise the specifications for equipment annually if the cost thereof is less than 20 percent of the total system cost. A more comprehensive revision to the specifications may be required not more often than every five years.

44037. The department shall compile and maintain records, using the sampling methodology necessary to ensure their scientific validity and reliability, of tests and repairs performed by qualified smog check mechanics at licensed smog check stations pursuant to this chapter on all of the following information:

(a) The motor vehicle identification information and the test data collected at the station.

(b) The number of maintenance and repair operations performed on motor vehicles which fail to pass a test conducted pursuant to this chapter.

(c) The correlation between maintenance and repairs recommended by the department pursuant to Section 44016 and maintenance and repairs performed.

(d) The charges assessed for the service and repairs.

(e) Any other information deemed essential by the department.

A written summary of all the above information shall be published quarterly for the mechanics and smog check stations in each district and shall be available to the public upon request.

44038. Each smog check station shall transmit vehicle data and emission test results to the department. Each smog check station shall also transmit to the department vehicle data and emission measurements made before and after repair. The department shall establish, by regulation, the form, manner, and frequency of the data transmittals.

44039. A written summary of the required information applicable to smog check stations in each district shall be published semiannually by the department and made available upon request to the owner of any motor vehicle subject to this chapter.

44040. The department may require certificates of compliance and certificates of noncompliance to contain a unique number encoded in bar code. These certificates may be sold to licensed smog check stations by the department or be printed by test analyzer systems. The department, with the cooperation of the Department of Motor Vehicles, shall periodically check certificates to determine their validity.

Article 4. Penalties

44050. (a) If, upon investigation, the department has probable cause to believe that a licensed smog check station, a licensed inspector, or a fleet owner licensed under Section 44020 has violated this chapter, or any regulation adopted pursuant to this chapter, the department may issue a citation to the licensee or fleet owner. The citation shall specify the nature of the violation and may specify civil penalty assessed by the department pursuant to Section 44051 or 44051.5.

(b) If, upon investigation, the department has probable cause to believe that a qualified smog check mechanic has violated Section 44012, 44015, 44016, or 44032 or any regulation adopted pursuant to this chapter, the department may issue a citation to the mechanic. The citation shall specify the nature of the violation and, in addition, whichever of the following applies:

(1) For a first citation, the smog check mechanic shall successfully complete one or more retraining courses prescribed by the department pursuant to subdivision (d) of Section 44031.5.

(2) For a second citation, the smog check mechanic shall successfully complete one or more retraining courses prescribed by the department pursuant to subdivision (d) of Section 44031.5 and the mechanic shall perform no inspection or repair pursuant to this chapter until that completion.

(3) For a third citation, the smog check mechanic shall successfully complete an advanced retraining course prescribed by the department and shall perform no inspection or repair pursuant to this chapter until that completion.

(4) For a fourth citation, the smog check mechanic's qualification shall be permanently revoked.

(c) The citation shall be served pursuant to subdivision (c) of Section 11505 of the Government Code.

44051. The civil penalty for a violation of the specified provisions of this chapter is as follows:

Section	Short Description of Violation	Civil Penalty	
		Minimum	Maximum
44002	Smog check estimates and invoices	$ 50	$ 500
44012(a)	No emission control system inspection	250	1,500
44012(b)	No emissions test	250	1,500
44014(a)	Unlicensed smog check station or mechanic	250	1,500
44015(a,b,c)	Failure to issue certificate signed by licensed inspector	150	1,000
44016	Failure to follow established repair procedures	150	1,000
44017	Cost limitation requirement	150	1,000
44031.5(a)	Test/repair by unlicensed smog check station or nonqualified smog check mechanic	250	1,500
44033(a)	Smog check station requirement	100	500
44033(b)	Test on condition of mandatory repair waiver	250	1,500
44033(d)	Test/repair charges separate	100	500
44036(b)	Smog check station certified equipment requirement	150	1,500
44060	Sale, transfer, or purchase of certificate	250	1,500

44051.5. The civil penalty for a violation of the specified sections of Title 16 of the California Administrative Code is as follows:

Section	Short Description of Violation	Civil Penalty Minimum	Civil Penalty Maximum
3340.15(a–j)	Smog check station general requirements	$100	$ 500
3340.16	Smog check station equipment and testing procedures	150	1,000
3340.16.5	Smog check station equipment and testing procedures	150	1,000
3340.17	Smog check station equipment maintenance and calibration	150	1,000
3340.22	Smog check station sign requirement	100	500
3340.23	Smog check cease operations	250	1,500
3340.25	Licensed inspector requirement	150	1,000
3340.30	Qualified mechanic's training and certification requirement	100	500
3340.35	Certification of compliance and noncompliance requirement	250	1,500
3340.37	NOx device/sticker requirement	100	500
3340.41	Inspection/test/repair requirement	150	1,000
3340.42	Inspection standards, test procedures, and exhaust emissions requirement	$100	$500
3340.45	Cost limitation requirement	100	500

44052. [Renumbered 44059]

44053. (a) Any person issued a citation pursuant to Section 44050 may request a hearing in accordance with Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code. A request for a hearing shall be submitted in writing within 30 days of service of the citation, and shall be delivered to the office of the department in Sacramento. Hearings and related procedures under this section shall be conducted in the same manner as proceedings for adjudication of an accusation under that Chapter 5, except as otherwise specified in this article.

(b) If, within 30 days from service of the citation, the licensee or qualified mechanic fails to request a hearing, the citation shall be deemed the final order of the department.

44054. In assessing a civil penalty pursuant to a citation issued pursuant to Section 44050, the director shall give due consideration to the gravity of the violation, including, but not limited to, a consideration of whether any of the following apply to the licensee:

(a) A failure to perform work for which money was received.

(b) The making of any false or misleading statement in order to induce a person to authorize repair work or pay money.

(c) The commission of numerous or repeated violations.

(d) A failure to make restitution to customers affected by the licensee's violation.

44055. (a) Any failure to comply with the final order of the department for payment of a civil penalty, or to pay the amount specified in any settlement executed by the licensee and the Director of Consumer Affairs, shall result in denial of any application for the renewal of the license. The department shall not renew a license or furnish any certificate of compliance or noncompliance forms to the licensee until all civil penalties which have become final, or amounts agreed to in a settlement, have been paid by the licensee.

(b) The department may deny an application for the renewal of a test station or repair station license if the applicant, or any partner, officer, or director thereof, has failed to pay any civil penalty in accordance with this article.

44056. (a) Except as otherwise provided in Sections 44051 and 44051.5, any person who violates any provision of this chapter, or any order, rule, or regulation of the department adopted pursuant to this chapter, is liable for a civil penalty not to exceed five hundred dollars ($500) for each day in which each violation occurs. Any action to recover civil penalties shall be brought by the Attorney General in the name of the state on behalf of the department, or may be brought by any district attorney, city attorney, or attorney for a district.

(b) The penalties specified in subdivision (a) do not apply to an owner or operator of a motor vehicle, except an owner or operator who does any of the following:

(1) Obtains, or who attempts to obtain, a certificate of compliance or noncompliance without complying with the requirements of Section 44015.

(2) Registers a motor vehicle at an address other than the owner's or operator's residence address for the purpose of avoiding the requirements of this chapter.

44057. A continuing violation of any provision of this chapter, or any order, rule, or regulation of the department adopted pursuant to this chapter, may be enjoined by the superior court of the county in which the violation is occurring. The action shall be brought by the attorney general in the name of the state on behalf of the department, or may be brought by any district attorney, city attorney, or attorney for a district. An action brought under this section shall conform to the requirements of Chapter 3 (commencing with Section 525) of Title 7 of Part 2 of the Code of Civil Procedure, except that it shall not be necessary to show lack of an adequate remedy at law or to show irreparable damage or loss.

In addition, if it is shown that the respondent continues, or threatens to continue, to violate any provision of this chapter, or any order, rule, or regulation of the department adopted pursuant to this chapter, it shall be sufficient proof to warrant the immediate granting of a temporary restraining order.

44058. Any person who violates this chapter, or any order, rule, or regulation of the department adopted pursuant to this chapter, is guilty of a misdemeanor and shall be punished by a fine of not more than one thousand dollars ($1,000) or by imprisonment for not more than six months, or by both, in lieu of the imposition of the civil penalties.

44059. The willful making of any false statement or entry with regard to a material matter in any oath, affidavit, certificate of compliance or noncompliance, or application form which is required by this chapter or Chapter 20.3 (commencing with Section 9880) of Division 3 of the Business and Professions Code, constitutes perjury and is punishable as provided in the Penal Code.

Article 5. Financial Provisions

44060. (a) The department shall prescribe the form of the certificate of compliance or noncompliance. The department shall charge a fee to licensed smog check stations for the issuance by the department to the stations of certificate of compliance or noncompliance forms. The fee charged shall be calculated to allow funding of the department and any other state agency directly involved in the implementation of the motor vehicle inspection program, and shall not exceed the amount reasonably necessary to fund the operation of the program, including all responsibilities, requirements, and obligations imposed upon the department or any of those state agencies by this charter, which are not otherwise recoverable by license fees pursuant to Section 44034. Except for adjustments to reflect changes in the Consumer Price Index, as published by the United States Bureau of Labor Statistics, the fee for each certificate of compliance or noncompliance shall not exceed six dollars ($6). It is the intent of the Legislature that the Vehicle Inspection and Repair Fund shall maintain a prudent surplus. If the surplus exceeds reasonable costs of administration of the programs specified in this chapter and in Chapter 20.3 (commencing with Section 9880) of Division 3 of the Business and Professions Code, the department shall, by regulation, prescribe a lower fee for the certificate of compliance or noncompliance.

(b) The sale or transfer of any certificate of compliance or noncompliance by a licensed smog check station to any other licensed smog check station or any other person, and the purchase or acquisition of any certificate of compliance or noncompliance by any person, other than from the department, the department's designee, or pursuant to a vehicle inspection or repair conducted pursuant to this chapter, is prohibited.

44061. The fees and penalties collected by the department pursuant to this chapter shall be deposited in the Vehicle Inspection and Repair Fund in accordance with the procedures established by the department, and is available to the department, as specified by Section 9886.2 of the Business and Professions Code, and, upon appropriation by the Legislature, to another state agency directly involved in the implementation of the motor vehicle inspection program, to carry out its functions and duties specified in this chapter or in any other law.

44602. The Vehicle Inspection Fund and the Automotive Repair Fund are hereby abolished. The balances in those funds are hereby transferred to the Vehicle Inspection and Repair Fund.

All fees collected by the department under this chapter and Chapter 20.3 (commencing with Section 9880) of Division 3 of the Business and Professions Code shall be deposited in the Vehicle Inspection and Repair Fund and are available to the department as specified by Section 9886.2 of the Business and Professions Code.

Article 6 Public Information

44070. (a) The department shall develop within the Bureau of Automotive Repair, with the advice and technical assistance of the state board, a public information program for the purpose of providing information designed to increase public awareness of the smog check program through out the state and emissions warranty information to motor vehicle owners subject to an inspection and maintenance program required pursuant to this chapter. The department shall provide, upon request, either orally or in writing, information regarding emissions related warranties and available warranty dispute resolution procedures.

(b) The telephone number and business hours, and the address if appropriate, of the emissions warranty information program shall be noticed on the vehicle inspection report provided by the test analyzer system for any vehicle which fails the analyzer test.

44071. For purposes of implementing the smog check public awareness and emissions warranty information programs, the department shall use funds from the fee charged for each certificate of compliance or noncompliance which are deposited in the Vehicle Inspection and Repair Fund pursuant to Section 44060.

CHAPTER 6. DIRECT IMPORT USED MOTOR VEHICLES

44200. For purposes of this chapter, "direct import used motor vehicle" means a 1975 or later model-year light-duty motor vehicle not originally intended by the manufacturer for sale in the United States which is at least two years old and was not certified by the state board pursuant to Article 1 (commencing with Section 43100) of Chapter 2.

For the purposes of this section, the age of a motor vehicle shall be determined by the following, in descending order of preference:

(a) From the first calendar day of the model year as indicated in the vehicle identification number.

(b) From the last calendar day of the month the vehicle was delivered by the manufacturer as shown on the foreign title document.

(c) From January 1 of the same calendar year as the model year shown on the foreign title document.

(d) From the last calendar day of the month the foreign title document was issued.

44201. The state board shall adopt, by regulation, a certification program for direct import used motor vehicles. The state board shall issue a certificate of conformance to each direct import used motor vehicle which meets the requirements of this program.

44202. A direct import used motor vehicle which was not registered in this state prior to the adoption of regulations adopted pursuant to Section 44201, may not be registered in this state unless it has received a certificate of conformance from the state board, except as provided in Section 44210.

44203. The certification program established pursuant to Section 44201 shall require all of the following components:

(a) A test of the vehicle's emissions performed at a laboratory licensed by the state board.

(b) A determination that the emissions of the vehicle meet applicable emission standards adopted by the state board.

(c) Any vehicle labelling and description of any emissions-related modifications to the vehicle that the state board finds appropriate to assure that the emission-related system of the vehicle can be inspected, serviced, and repaired successfully throughout the state.

(d) Any other requirements the board may determine appropriate to assure the direct import used motor vehicle will continue to comply with emission standards in use, except that no requirement may be established to warrant the emissions control system or to recall vehicles which exhibit a defective emission control system subsequent to receiving a valid certificate of conformance.

44204. The state board may perform a confirmatory test of the vehicle's emissions prior to issuance of a certificate of conformity.

44205. The state board shall adopt regulations prescribing the requirements for any laboratory seeking approval as a state-licensed laboratory for purposes of this chapter. The requirements shall include, but not be limited to, all of the following:

(a) An agreement to random inspections of the facility and any vehicles on the premises by the state board or its designee.

(b) Recordkeeping for testing and quality control.

(c) An agreement to perform correlation testing at the request of the state board.

(d) An agreement to hold vehicles at the laboratory for up to 10 calendar days for the purpose of inspection and confirmatory testing upon request of the state board.

44207. A laboratory's license may be suspended or revoked by the state board, after a hearing, for failure to meet the requirements of licensing established in Section 44205 or for other cause specified by the state board in regulation. The state board shall adopt regulations governing the suspension, revocation, and reinstatement of the licenses.

44208. The state board may, by regulation, impose fees for the licensing of laboratories and for the issuance of certificates of conformity to recover the state board's costs, including enforcement costs, of administration of any program the state board may establish pursuant to this chapter.

44209. Any person who falsifies any test record or report which has been submitted to any other person, the department, or the state board pursuant to this chapter is subject to punishment by a fine of not less than one thousand dollars ($1,000) or more than five thousand dollars ($5,000), by imprisonment for not more than five years, or by both the fine and imprisonment.

44210. The requirements of Section 44202 do not apply to any motor vehicle having a certificate of conformity issued by the federal Environmental Protection Agency pursuant to the federal Clean Air Act (42 U.S.C. Section 7401, et seq.) and originally registered in another state by a person who was a resident of that state for at least one year prior to the original registration, who subsequently establishes residence in this state and who, upon registration of the vehicle in California, provides evidence satisfactory to the Department of Motor Vehicles of that previous residence and registration.

PART 6.
AIR TOXICS "HOT SPOTS" INFORMATION AND ASSESSMENT.

CHAPTER 1.
Legislative Findings and Definitions.

44300. This part shall be known and may be cited as the Air Toxics "Hot Spots" Information and Assessment Act of 1987.

44301. The Legislature finds and declares all of the following:

(a) In the wake of recent publicity surrounding planned and unplanned releases of toxic chemicals into the atmosphere, the public has become increasingly concerned about toxics in the air.

(b) The Congressional Research Service of the Library of Congress has concluded that 75 percent of the United States population lives in proximity to at least one facility that manufactures chemicals. An incomplete 1985 survey of large chemical companies conducted by the Congressional Research Service Documented that nearly every chemical plant studied routinely releases into the surrounding air significant levels of substances proven to be or potentially hazardous to public health.

(c) Generalized emissions inventories compiled by air pollution control districts and air quality management districts in California confirm the findings of the Congressional Research Service survey as well as reveal that many other facilities and businesses which do not actually manufacture chemicals do use hazardous substances in sufficient quantities to expose, or in a manner that exposes, surrounding populations to toxic air releases.

(d) These releases may create localized concentrations or air toxics "hot spots" where emissions from specific sources may

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1. The State Implementation Plan and all applicable transportation control measures either approved by or promulgated for the State of Colorado by the U.S. Environmental Protection Agency.

2. Attainment of ambient air quality standards through implementation of transportation plans and programs, and no violation of Ambient Air Quality Standards once any such standards have been attained in the area addressed by the transportation plans and programs. Attainment and/or violations shall be determined by emperical measurement or modeling.

3. No violation of Ambient Air Quality Standards in the area addressed by the transportation plans and programs where no violation exists as of the effective date of this regulation. Violations shall be determined by emperical measurement or modeling.

4. No delay in attainment where attainment would otherwise be met without the plans and programs in question.

E. All final determinations of conformity or non-conformity shall be forwarded by the Commission to the appropriate metropolitan planning organization and the Department for submission to the Federal Highway Administration or for other determination in accord with provisions of 23 CFR Part 770.

F. The preparation and promulgation of new or modified plans or programs by a Metropolitan Planning Organization shall proceed in consultation with the Division. The Division may also provide advice and assistance regarding air quality analyses and evaluations. Such Division participation should assure that air quality conformity problems are identified early and that local Metropolitan Planning Organizations receive adequate air quality input throughout their planning process.

REGULATION NO. 11

(Adopted August 24, 1978; Amended November 20, 1980; March 12, 1981; April 9, 1981; October 8, 1981; January 28, 1982; April 22, 1982; July 22, 1982; November 18, 1982; September 22, 1983; November 10, 1983; October 18, 1984; November 15, 1984; December 19, 1985; January 15, 1987; February 18, 1988)

PART A

General Provisions, Including Area of Applicability, Schedule for Obtaining Certifications of Emission Control, Definitions, and Exemptions for Disconnection and Reconnection of Air Pollution Devices

I. APPLICABILITY

Subject to the Provisions described in Sections I.A. and I.B. of this Part A. and pursuant to the schedule in Section I.C. of this Part A, all non-diesel fueled motor vehicles which are registered in the AIR program area or which motor vehicle is owned or operated by a non-resident who meets the requirements of Section 42-4-312(1)(b.5), will be subject to an exhaust gas and emissions control equipment inspection as a prerequisite to initial or renewal of the vehicle registration. Non-residents will comply with inspection requirements annually.

A. Geographic Areas of Applicability. This regulation shall apply to the AIR Program areas as defined in Section 42-4-307(8) C.R.S.

B. Vehicles eligible for AIR program inspection procedures. This regulation shall apply to all motor vehicles as defined in Section 42-4-307(7) C.R.S.

The burden of proof in establishing an exemption from inclusion in all or any part of the AIR Program inspection requirements is on the vehicle owner.

C. Schedule for Obtaining Certification of Emissions Control

1. A means will be provided by the Departments of Health and Revenue for those motor vehicle owners to establish proof of compliance with AIR Program inspection requirements during the transition period from existing to automated procedures. The Division will assist in providing information to affected motorists regarding inspection requirements.

2. On or after July 1, 1987, no used vehicle which is registered in the program area shall be registered in the program area by a new owner, and no vehicle shall be registered for the first time in the program area, unless such vehicle has a certification of emissions control or of emissions exemption. A new owner of a used vehicle required to obtain a certification of emissions control may require the prior owner to provide said certification at the time of sale. If a motor vehicle is being registered for the first time in the program area, the owner shall obtain the certification and submit it with the application for registration.

3. From July 1, 1987 and thereafter, any motor vehicle may be voluntarily inspected and a certification of emissions control obtained which shall be valid for one year.

4. On or after July 1, 1987, all motor vehicles, except those owned by the United States government, the State of Colorado and local governments, shall be inspected once each year, comply with the inspection provisions and obtain a valid certification of emissions control prior to the time of initial registration or renewal of registration pursuant to the requirements of C.R.S. 42-4-312, as amended. The certification of emissions control will be valid for one year from date of issuance.

5. On or after July 1, 1987, all motor vehicles owned by the United States Government or the State of Colorado, and local governments shall be inspected once each year, comply with the inspection provisions and a certification of emissions control obtained. Inspection results will be reported to the Department of Revenue by transfer of the certification of emissions control.

6. New motor vehicles being registered with a manufacturer's statement of origin (MSO) shall be issued a registration without a certificate of emissions control.

7. Compliance with AIR Program inspection requirements will not be required for wholesale transactions between motor vehicle dealers licensed pursuant to Article 6 of Title 12, C.R.S. For used vehicle retail sales transactions by a licensed dealer conducted within the AIR Program area, a certificate of emissions control will be required at the time of sale. The responsibility of complying with the inspection provisions is that of the selling dealer.

II. DEFINITIONS

Unless the context requires otherwise, the definitions used in this regulation are as follows:

A. "Air Account" is a special fund set aside in the Highway Users Tax Fund for the operation of the "AIR Program."

B. "AIR Program" is the Automobile Inspection and Readjustment (AIR) Program established pursuant to Section 42-4-306.5 to 42-4-316, C.R.S. as amended.

C. "AIR Program Station" is an Automobile Inspection and Readjustment (AIR) Station that qualifies and is licensed to operate as an emissions inspection and readjustment station in the Automotive Inspection and Readjustment Program.

D. "BAR 74, BAR 80 and BAR 84" refer to the California Bureau of Automotive Repair *Exhaust Gas Analyzer Specifications* which became effective in 1974 (BAR 74), on April 1, 1980 (BAR 80) and 1984 (BAR 84).

E. "Calibration" is the process of establishing or verifying the total response curve of an exhaust gas analyzer. Calibration is a laboratory procedure using several different calibration gases having precisely known concentrations. ("Calibrate" as used in Section 42-4-308, subsection (6) of the Colorado Revised Statutes should be interpreted as "Gas Span Check.")

F. "Calibration Gases" are gases of precisely known concentration which are usually used in the laboratory as references for establishing or verifying the calibration curve of an exhaust gas analyzer.

G. "Division" is the Air Pollution Control Division of the Colorado Department of Health.

H. "Electrical, Electronic, or Electromechanical Span" is the adjustment of an exhaust gas analyzer using an electronic signal rather than a calibration or span gas as a reference source.

I. "Executive Director of the Department of Health" is the representative of the Department of Health responsible for the technical expertise, technical centers, and licensing mechanics.

J. "Executive Director of the Department of Revenue" is the representative of the Department of Revenue responsible for the field enforcement of the "AIR Program."

K. "Exhaust Gas Analyzer" is an instrument which is capable of measuring the concentrations of certain air contaiminants in the exhaust gas emanating from a motor vehicle.

L. "Gas Span" is the adjustment of an exhaust gas analyzer to correspond with known concentrations of HC and CO span gases.

M. "Gas Span Check" is a procedure using known concentrations of HC and CO span gases to verify the gas span adjustment of an analyzer.

N. "General Assembly" means both houses of the Colorado State Legislature.

O. "Handbook — Consumer" is a publication prepared by the Public Relations Office explaining the "AIR Program" for distribution to the general public.

P. "Motor Vehicle" includes only a motor vehicle which is operated with four wheels or more on the ground, self-propelled by liquid gasoline or liquid gasohol, with the exception of the vehicles listed in Part A., Section I.B.

Q. "Motor Vehicle Emissions Compliance Officers (MVECO)" are those persons employed by the Department of Revenue for licensing and enforcement of the AIR Program.

R. "Span Gases" are gases of known concentration used as references to adjust or verify the adjustment of an exhaust gas analyzer's span settings.

S. "State Emissions Technical Center Personnel" are those persons employed by the Department of Health for technical or administrative support of the AIR Program.

T. "Zero Gas" is a gas, usually air or nitrogen, which is used as a reference for establishing or verifying the zero point of an exhaust gas analyzer.

III. EXEMPTION FROM C.R.S. 42-4-1210 FOR DEPARTMENT OF DEFENSE PERSONNEL PARTICIPATING IN THE PRIVATELY OWNED VEHICLE IMPORT CONTROL PROGRAM:

A. U.S. Department of Defense (DOD) personnel participating in the DOD POV (privately owned vehicle) Import Control Program operating a 1975 or subsequent model year automobile, are exempt from the prohibition of C.R.S., 42-4-1210(2) insofar as it pertains to filler neck restrictors, catalytic converter systems, and, if applicable, exhaust gas oxygen (O_2) sensor(s), if one of the following conditions are met:

1. The automobile will be driven to the port and surrendered for exportation under said program within ten (10) working days of disconnection, deactivation, or inoperability of the restrictor or catalytic converter systems, or exhaust gas oxygen (O_2) sensor(s); or

2. The reconnection, reactivation, or reoperability of the restrictor, catalytic converter systems, and, if applicable, exhaust gas oxygen (O_2) sensor(s), is made within ten (10) working days from the time the owner picked up the automobile at the port.

B. Persons disconnecting, deactivating, or rendering inoperable any filler neck restrictor, catalytic converter system, exhaust gas oxygen (O_2) sensor(s) on 1976 or subsequent model year automobile of DOD personnel participating in the DOD POV Import Control Program which will be driven to the port and surrendered for exportation under said program within ten (10) working days are exempt from the prohibition of C.R.S., 42-4-1210(1).

PART B

Standards and Procedures for the Approval, Operation, Gas Span Adjustment, and Certification of the Division Approved Exhaust Gas Analyzers

I. DEFINITIONS

Unless the context otherwise requires, the definitions used in this part are:

A. "Accreditation" means certification that the instrument and instrument manufacturer meet the operating criteria specifications and requirements of the Colorado Department of Health, Air Quality Control Commission.

B. "Certification" means assurance by the authorized source, whether it be a laboratory, the manufacturer, or the State, that a specific product or statement is in fact true and meets all required accreditation requirements.

C. "Compliance" means verification that certain submission data and hardware submitted by a manufacturer for accreditation consideration, meet all required accreditation requirements.

D. "Instrument" is the complete system which samples and reads out the concentration of pollutant HC and CO gas. The instrument includes the sample handling system, the exhaust gas analyzer and the enclosure cabinet.

E. "Standardized Instruments" are laboratory instruments calibrated with precision gases traceable to the National Bureau of Standards and accepted by the Commission as the standards to be used for comparison purposes. All candidate instruments are compared in performance to the standardized instruments.

F. "True Concentration" is the concentration of the gases of interest as measured by a standardized instrument which has been calibrated with 1% precision gases traceable to the National Bureau of Standards.

II. APPROVAL OF THE EXHAUST GAS ANALYZERS

A. From July 1, 1987 and thereafter, no emissions inspection required by the Air Program shall be performed unless the instrument used for measuring exhaust gases from motor vehicles is identified as a Colorado AIR Program Modified BAR-84 exhaust gas analyzer. Sources of vendors for the approved analyzers may be obtained from the Program Administrator, Mobile Sources Section, Air Pollution Control Division, Colorado Department of Health, 4210 East 11th Avenue, Denver, CO 80220.

B. As an element of accreditation, the Division will accept a Certification statement for the exhaust gas analytical and sampling system portion of the Colorado AIR Program modified BAR-84 exhaust gas analyzer from the California Bureau of Automotive Repair (BAR) or a recognized laboratory. The manufacturers' compliance with the revisions and additions to the specifications necessary for use of the instrument within the AIR Program will be determined by the Division or its designee. Those testing procedures are to be included with the bid specifications.

C. The following statement is not a requirement of the Air Program for approval of an exhaust gas analyzer and is included to make manufacturers and purchasers of exhaust gas analyzers aware of the warranty requirements of Section 207(b) of the Federal Clean Air Act, as amended 1981.

207(b) Warranty Requirements: Unless an exhaust gas analyzer has been certified by the manufacturer as having met the specifications of 40 CFR Part 85, Subpart W as published in Part IX of the May 22, 1980 Federal Register, an inspection performed using that analyzer may not qualify a 1982 or later model year vehicle for warranty repair coverage according to the provisions of the Emission Control System Performance Warranty (Section 207(b) of the Federal Clean Air Act).

III. APPLICATIONS FOR APPROVAL OF EXHAUST GAS ANALYZER EQUIPMENT MANUFACTURERS

Pursuant to Section 42-4-309(3), the Division shall develop equipment specifications for the implementation of BAR-84 exhaust gas analyzers as modified for use within the AIR Program. Those manufacturers wishing to participate in the open bid process shall make application with the Department of Administration, 1575 Sherman Street, Denver, CO 80203 on forms provided thereby. All manufacturers making application shall meet the requirements as specified by the Department of Administration and the Procurement Code, Articles 101-112 of Title 24, C.R.S.

A manufacturer requesting the approval of an instrument for the measurement of exhaust gases for use in the AIR Program station shall make application therefor with the Air Pollution Control Division, 4210 East 11th Avenue, Denver, Colorado 80220, on forms provided thereby. All manufacturers making application shall meet the technical specifications and administrative requirements specified by the Air Pollution Control Division.

IV. PERFORMANCE AND DESIGN SPECIFICATIONS FOR THE EXHAUST GAS ANALYZERS

Pursuant to Section 42-4-309(3) the Division will develop specifications for the exhaust gas analyzer required for inspections conducted July 1, 1987 and thereafter. These specifications include but are not limited to the provisions of California BAR-84, data collection, service/maintenance, requirements for replacement or loan instruments and warranty for the period of the agreement. These specifications are described in a separate document entitled "Colorado AIR Program modified BAR-84 Exhaust Gas Analyzer Specifications" as adopted by the Commission. This information is available from the Air Pollution Control Division, Mobile Sources Section, 4210 EAST 11th Avenue, Denver, CO 80220. Those manufacturers making application should refer to Section III of this Part B.

V. SPAN GASES:

A. General: The instrument manufacturer and his designated marketing vendors shall, on request, supply span gases approved by the Division to any ultimate purchaser of his unit. The instrument manufacturer shall also provide the analyzer purchaser with a comprehensive, up-to-date list (with addresses and phone numbers) of gas blenders approved by the Commission. Each new or used instrument sold by the instrument manufacturer or marketing vendor shall have a full span gas container installed and operational at time of delivery if the instrument is designed to incorporate an integral span gas supply.

B. Span Gas Blends: The span gas concentrations supplied to the AIR Program stations shall conform to the specifications contained in Section VII of this Part B.

Accuracy of the AIR Program station span gas blends shall be certified by the gas blender to be within ±2% of the labeled concentration and shall be traceable to the National Bureau of Standards. Only gas blends supplied by Division approved blenders shall be offered for sale with approved instruments.

C. Containers: Span gases shall be supplied in containers which meet all the provisions of the Occupational Safety and Health Administration (OSHA) as specified in 36 Federal Register 105, dated May 29, 1971. Containers will be low pressure, 7.5 cu.ft. DOT 39 nonrechargable.

D. Optical Correction Factor (also referred to as "C" factor, propane to hexane conversion factor"): Each instrument shall be permanently labeled with its correction factor, carried to at least two DECIMAL places (within the gas accuracy limits), eg., (0.52). Factor confirmation shall be made on each assembled analyzer by measuring both N-hexane and propane on assembly line quality checks.

E. Running Changes and Equipment Updates: Any changes to design or performance characteristics of component specifications which may affect instrument performance must be approved by the Commission. It will be the instrument manufacturer's responsibility to confirm that such changes have no detrimental effect on analyzer performance. All Colorado modified BAR '84 exhaust gas analyzers will be updated as needed and specified in the specifications document.

VI. DOCUMENTATION, LOGISTICS, AND WARRANTY REQUIREMENTS

A. Instruction Manual: The instruction manual accompanying each analyzer shall contain at least the following:

1. Complete technical description.
2. If available, functional schematics (mechanical and electrical).
3. Accessories and options (included and/or available).
4. Model number, identification markings and location.
5. Operating maintenance to include periodic recommendations, i.e., daily, weekly, monthly, and procedure for maintaining sample system integrity (leaks, hangup, calibration, filters, etc.).
6. Required service schedule identifying the items needing maintenance and the procedures to be followed by the purchaser. The services to be performed only by the manufacturer shall be clearly identified.
7. Warranty provisions to include listing of warranty repair stations by name, address, and phone number.
8. The name, address, and phone number of the permanent Colorado representative to control training, service, warranties, etc..

VII. CALIBRATION OF EXHAUST GAS ANALYZERS

The Division shall use and require for use in the calibration and spanning of exhaust gas analyzers calibration and span gases and containers meeting the following parameters, blends, and specifications:

A. Standardizing Instruments. The calibration gases for standardizing instruments shall conform to the provisions outlined in 40 CFR, Part 86, Subpart B114 for automotive exhaust emissions testing. Those gases shall be of "precision" quality, certified to be within ±1% of the labeled concentration, and traceable to the National Bureau of Standards.

B. AIR Program Station Instruments. The span gases supplied to AIR Program stations shall conform to the following:

1. The carrier gas shall be nitrogen; the hydrocarbon gas shall be propane. Three component (HC, CO, CO_2 and carrier) gases may be provided.

2. The concentration(s) of the span gas blend shall be within limits established by the Division to provide for uniform exhaust gas analyzer spanning.

3. The accuracy of the AIR Program station span gas blend shall be certified by the blender to be ±2% of labeled concentration and traceable to the National Bureau of Standards.

4. AIR Program stations will gas calibrate the exhaust gas instrument once each seven days as determined by the instrument or as needed in order to maintain accuracy.

5. ALL AIR Program exhaust gas analyzers will be calibrated only with span gases bearing a Colorado approval label.

C. Accuracy. A gas supplier shall initially demonstrate its qualifications as a vendor of span gases. The Division may require additional evidence of qualifications at periodic intervals. All gas suppliers will be required to abide by the "Colorado Approved Span Gas Verification Program" established by the Division.

D. Containers. All gases shall be supplied in containers which meet the requirements of the Occupational Safety and Health Administration (OSHA), as specified in 36 Federal Register 105, dated May 29, 1971.

E. Additional specifications related to calibration requirements are described in the specifications document.

PART C

"Licensing of Inspection and Readjustment Stations
and the Procedures and Practices to Ensure the
Proper Performance of Inspections and Adjustments

I. DEFINITIONS

Unless the context otherwise requires, the definitions in this Part C are:

A. "Air Intake Systems" are those systems which allow for the induction of ambient air (to include preheated air) into the engine combustion chamber for the purpose of mixing with a fuel for combustion.

B. "Air System" is a system for providing supplementary air into the vehicles' exhaust system to promote further oxidation of HC and CO gases and to assist catalytic reaction.

C. "Basic Engine Systems" are those parts or assemblies which provide for the efficient conversion of a compressed air/fuel charge into useful power to include but not limited to valve train mechanisms, cylinder head to block integrity, piston-ring-cylinder sealing integrity and post-combustion emissions control device integrity.

D. "Catalytic Converter" is a post combustion device which oxidizes HC and CO gases and/or reduces oxides of nitrogen.

E. "Emissions Control Systems" are those parts, assemblies or systems originally installed by the manufacturer in or on a vehicle for the sole purpose of reducing emissions.

F. "Fuel Control Systems" are those mechanical, electromechanical, galvanic or electronic parts or assemblies which regulate the air/fuel ratio in an engine for the purpose of providing a combustible charge.

G. "Fuel Filler Neck Restrictor" is the orifice and obstruction in the gas tank filler neck that prevents the introduction of a "leaded gasoline" nozzle.

H. "Gross Vehicle Weight (GVW) Rating" is the maximum recommended combined weight of the motor vehicle and its load as prescribed by the manufacturer and expressed on a permanent identification label affixed to the motor vehicle.

I. "Heavy Duty Vehicles (HDV)" are those motor vehicles for model years 1978 and earlier having a GVW rating of greater than 6000 pounds and for model years 1979 and newer, having a GVW rating of greater than 8,500 pounds.

J. "Idle Mode" means a condition where the vehicle engine is warm and running at the rate specified by the manufacturer's curb idle, where the engine is not propelling the vehicle, and where the throttle is in the closed or idle stop position.

K. "Ignition Systems" are those parts or assemblies which are designed to cause and time the ignition of a compressed air/fuel charge.

L. "Inspection Area" is the area that is occupied by the analyzer, sample hose and the vehicle being inspected.

M. "Light Duty Vehicles (LDV)" are those motor vehicles (to include trucks) for model years 1978 and earlier having a GVW rating of 6,000 pounds or less and for model years 1979 and newer having a GVW rating of 8,500 pounds or less.

N. "Original Condition" means the condition as installed by the manufacturer but not necessarily to the original level of effectiveness.

O. "Rules" are publications prepared by the Department of Revenue containing inspection procedures, high altitude specifications and general information about the "AIR" Program.

II. REQUIREMENTS FOR LICENSING OF AN AIR PROGRAM STATION

A. The following tools shall be available for performance of the inspection and adjustments:

1. Division approved calibrated and spanned exhaust gas analyzer.

a. As a provision of continued license to perform AIR Program inspections, the exhaust gas analyzer must be updated as required by the Division.

b. AIR Program stations are encouraged to take advantage of available service/maintenance and extended warranty contracts. These contracts are not a requirement of licensing.

2. Rules for the operation of an AIR Program inspection station provided by the Colorado Department of Revenue.

3. Tachometer.

4. Emission control systems applications guide.

5. Dwell Meter.

6. Ignition timing light.

7. Propane kit for idle mixture adjustment.

8. Commercially available reference manuals giving idle speed, idle mixture, timing, dwell, fast idle speed specifications, high altitude specifications and information covering the emissions control systems description, diagnostic and repair procedures for the year models of vehicles involved in the AIR Program when available.

9. Sufficient hand tools and automotive diagnostic equipment for proper performance of the inspections, adjustments and emissions related repairs.

10. Division approved span gas and equipment for performing gas span checks.

11. Suitable non-reactive tail pipe extenders or probe adapter for inspecting vehicles with screened, or baffled exhaust systems.

12. The analyzer manufacturer's maintenance and calibration manual must be retained in the inspection area.

13. Items #3, 5, 6, 7, 8 and 9 above are not required for licensing as an inspection only station.

B. A licensed emissions mechanic is or will be available to make a proper inspection during all hours the station is open for business.

C. "Emissions Inspection-Only" AIR Program station must so indicate same by posting a sign in a readily visible location, and that no emissions related adjustments or repair services are available should the vehicle fail the inspection procedures.

D. A person to whom there are 10 or more vehicles registered, or to whom said number of vehicles are leased for not less than six continuous months, or are consigned for sale, may be licensed as a "fleet emissions inspection station" and conduct inspection of that fleet. As a fleet inspection station, no inspections may be conducted for the employees nor general public, but only on vehicles owned, leased by the business, or consigned or held in inventory for sale.

E. All AIR Program inspection stations are required to post in a conspicuous location in a clearly legible fashion a sign indicating the fees charged for inspections and maximum fees for emissions related adjustments and repairs required for the issuance of a certificate of emissions control.

III. INSPECTION PROCEDURE

A. All aspects of the inspection must be performed by a licensed emissions mechanic. It is the responsibility of the emissions mechanic to notify the Department of Revenue of his current place of employment.

The emissions mechanic not employed by an "Inspection-only station" shall notify the customer prior to initiating an emissions inspection if he/she is unable to perform the required five parameter adjustments and/or repairs for that particular vehicle should that vehicle fail the inspection. Otherwise the emissions mechanic shall not conduct an inspection on a motor vehicle unless that emissions mechanic so notifies the customer or is able to perform the five parameter adjustment AND/OR REPAIR procedures for that particular vehicle as prescribed by the manufacturer and specified by subpart IV of this part.

B. The entire inspection shall take place within the reach of the analyzer hose.

C. In consideration of maintaining inspection integrity:

1. The temperature of the inspection area shall be between 35°F and 110°F (2°C and 43°C) during the inspection. Inspection area temperatures must be accurately recorded, and monitored in a well-ventilated location away from vehicle engine and exhaust heat sources and out of direct sunlight.

2. The analyzer shall be kept in an area which affords adequate protection from the weather.

3. The electrical supply to the analyzer must be able to meet the analyzer manufacturer's requirements for voltage and frequency stability.

4. Effective July 1, 1987, a permanent location which meets all applicable zoning requirements to provide for the inspection of vehicles as defined within this section is required. Electrical supply must be public utility designated for that area.

D. The emissions mechanic shall accurately identify and enter vehicle and owner information as required for vehicle emissions inspection records.

E. For 1975 and later model year vehicles the emissions mechanic shall then perform an inspection for integrity of the emissions control systems. The inspection shall include:

1. Examining the emissions control information decal (sticker) under the hood or checking the reference manual or applications guide to determine if the vehicle, as manufactured and/or certified for sale or use within the United States, contained a catalytic converter, air injection reaction system, oxygen (O_2) sensor, "check engine light" and/or other system malfunction indicator, or requires the use of unleaded fuel.

2. Visually inspecting for the presence and operability of the air system, catalytic

converter system, oxygen (O_2) sensors, "check engine" dash indicator light, other system malfunction indicator(s), and fuel filler neck restrictor(s). If these parts or systems are inoperable, or have been removed, the vehicle will not qualify for a certification of emissions control. If the necessary part(s) will not be available prior to the month of expiration of the present vehicle registration, and the owner obtains a signed form or statement to that effect from a manufacturer's dealer for that make vehicle, or from an automotive parts supplier which in the normal course of business supplies part(s) for that vehicle, the Emissions Technical Center personnel after verification may issue a temporary certification of emissions control. The form or statement provided must specifically identify by part numbers and description, the necessary part(s). The owner then has until the expiration of the temporary certification to complete the necessary repairs or replacement.

3. If the vehicle fails the fuel filler neck restrictor inspection, the fuel filler neck restrictor as well as the catalytic converter(s) and, if applicable, exhaust gas oxygen (O_2) sensor(s) must be replaced to ensure the efficient operation of these emissions control systems. Any exception from this provision must be verified as a result of a Division-approved performance test.

F. The entire vehicle shall be in normal operating condition and at normal operating temperature, which may be determined by feeling the top radiator hose, by checking the temperature gauge, and/or operating the vehicle prior to performing the idle emissions inspection.

G. The inspection shall be performed with the transmission in Park or Neutral and with all accessories off.

H. 1. The analyzer probe shall be inserted at least twelve (12) inches or as recommended by the analyzer manufacturer for a quality sample whichever is greater.

2. For all vehicles equipped with a multiple exhaust system, the analyzer's dual exhaust procedure must be used.

3. If a baffle or screen prevents probe insertion to an adequate depth, a suitable probe adapter or snug fitting hose which effectively lengthens the exhaust pipe may be used.

4. The emissions inspection procedure shall be as follows:

a. For all model year vehicles, the emissions inspection will be a two-speed idle test, conducted in the following manner: A first reading will be taken at normal curb idle; the vehicle will be accelerated and stabilized at 2500 ± 300 rpm for several seconds and for model year 1981 and newer a second emissions reading taken. This second emissions reading for 1981 and newer vehicles will be taken at 2500 ± 300 rpm when the emissions levels stabilize or prior to 30 seconds, whichever occurs first as determined by the exhaust gas analyzer. The vehicle will be returned and stabilized at normal curb idle for a final reading. An accurate tachometer as provided by the exhaust gas analyzer must be used to verify engine speeds when performing a two-speed idle test. For model-year 1981 and newer, the vehicle's emissions must be the same as or less than the applicable standards at 2500 rpm ± 300 RPM. At normal curb idle, the lowest HC reading and the lowest CO reading from either normal curb idle test will be used. For pass/fail determination, the vehicle's emissions level must be the same as or less than the applicable standards at idle speed in order to pass the emissions inspection.

b. The appropriate emissions standards will be selected by the exhaust gas analyzer. In selecting appropriate emissions standards, for motor vehicles of model years 1978 and earlier having a gross vehicle weight (GVW) rating of greater than 6,000 pounds, or of model years 1979 and newer having a gross vehicle weight rating of greater than 8,500 pounds: the emissions mechanic shall identify that particular vehicle's GVW rating by examining the vehicle information (metal) plate or sticker. These motor vehicles will be subject to the applicable emissions standards as listed in part E. II. of this regulation. If the vehicle information plate or sticker is missing, illegible or the GVW rating information is not otherwise available, the emissions mechanic shall examine the engine exhaust emissions control information label which is permanently affixed to the engine and determine heavy-duty engine-/vehicle federal certification status. Vehicle engines not labeled as having complied with applicable U.S. EPA heavy-duty regulations by the manufacturer are assumed to be light-duty vehicles and subject to the emissions standards listed in part E. I. of this regulation.

I. The vehicle will be evaluated for the presence of visible smoke emissions at normal curb idle. Those vehicles exhibiting any gray, blue, blue-black, or black smoke emissions from the engine crankcase and/or tailpipe will be denied a certificate of emissions control.

J. A certification of emissions compliance shall be issued if the vehicle passes the emissions control systems inspection (for 1975 and newer model year vehicles only) the exhaust emissions inspection, and there is no evidence of visible smoke emissions.

K. If the vehicle fails the initial emissions inspection the owner has ten (10) days in which to have repairs or adjustments made and return the vehicle to the AIR Program station which performed the initial inspection for one (1) free reinspection. A temporary certificate of emissions control may be issued by technical center personnel to those vehicles failing the initial emissions inspection, continue to exceed applicable emissions standards after the five (5) required parameter adjustments have been accomplished, and for which emissions related parts are not presently available in order to make corrective repairs to that specific vehicle. Proof of part(s) non-availability as described in subpart III.E.2. of this part is required. In order to obtain a certification of emissions control the vehicle must meet one of the following conditions:

1. A certification of emissions compliance may be issued if:

a. The vehicle emissions levels are the same as or less than the applicable emissions standards; and

b. There are no smoke emissions visible from the vehicle engine crankcase and/or tailpipe, and

c. For 1975 and newer model year vehicles, the vehicle passes the emissions control systems inspection.

2. A certification of emissions adjustment may be issued if:

a. The vehicle passes the emissions control systems inspection (1975 and newer model year vehicles only) required by subpart III.E.2; and

b. The vehicle continues to exceed applicable emissions standards after the adjustments and repairs required by subpart IV AND V have been performed by a licensed emissions mechanic; and for model year 1980 and earlier at least fifty dollars

($50) has been spent, provided that proof of repair costs for that specific vehicle has been provided to the emissions technical center personnel or department of revenue personnel in the form of an itemized bill, invoice, work order, manifest, or statement in which emissions related parts and/or repairs, are specifically identified as specified in subpart C. of this section, or

c. For model years 1981 and newer, at least two hundred dollars ($200) has been spent on emissions related adjustments and repairs as specified in subpart V, performed by a licensed emissions mechanic, provided that proof of repair costs for that specific vehicle has been provided to the emissions technical center personnel or Department of Revenue personnel in the form of an itemized bill, invoice, work order, manifest, or statement in which emissions related parts and/or repairs, are specifically identified; or

d. An adequate emissions reduction as determined by the Division-approved (BAR-84) exhaust gas analyzer has resulted due to emissions related repairs and the applicable cost limit has been met. Proof of these emissions related repairs is required as specified in subpart C & D of this section and retained by the AIR Program station. The vehicle must have passed the emissions control systems inspection and there are no smoke emissions visible from the vehicle engine crankcase or exhaust system.

e. A certificate of emissions adjustment will not be issued to a vehicle which is elegible for the emissions control systems performance warranty, 207(b). Per the provisions of the 207(b) performance warranty, the repair costs necessary for compliance with AIR Program emissions standards specified in Part E of this Regulation will be borne by the vehicle manufacturer or his authorized dealer representative.

3. For motor vehicles with two-stroke cycle engines which meet the applicable carbon monoxide (CO) standard but exceed the applicable hydrocarbon (HC) standard, no adjustments are required and no adjustment fees may be charged for the issuance of certification of emissions adjustment. The no-smoke requirement of Section III (I) of this Part C does not apply to vehicles with two-stroke cyclic engines.

4. a. For inspections conducted July 1, 1987 through June 30, 1988, the no visible smoke requirement for all vehicles and emissions control systems equipment requirements for model years 1975-81 will not require corrective repairs. Notification will be provided of deficiencies observed during the inspection procedures. This notification period does not pertain to model year 1982 and newer vehicles having emissions control system deficiencies. Restoration of applicable emissions control systems is required in order to obtain a certification of emissions control. For all inspections conducted July 1, 1988 and thereafter, corrective repairs will be required for all vehicles exhibiting smoke and/or not complying with applicable emissions control systems requirements.

b. For inspections conducted in the Weld County AIR Program area, this phase-in notification period of Paragraph A of this subsection will apply to all model year vehicles. After December 31, 1988 a certificate of emissions control shall not be issued for vehicles inspected in the Weld County program area exhibiting smoke and/or emissions control equipment deficiencies for 1975 and newer vehicles.

L. The emissions mechanic shall generate the appropriate vehicle inspection report forms and certificate of emissions control and distribute. The emissions mechanic will remove expired emissions control certification windshield stickers. The vehicle inspection report is to be signed by the issuing emissions mechanic.

IV. ADJUSTMENT PROCEDURES

Procure from the rules provided by the Colorado Department of Revenue the high altitude specifications for idle speed, idle mixture, ignition timing, dwell, and fast idle speed for the purpose of adjustment. If no high altitude specifications are in the rules refer to the emissions decal, other applicable specifications guide, or sea level specifications in the reference manual for proper specifications.

A. With a dwell meter, check to determine if the ignition dwell is within the recommended tolerance of ±2° of specifications. Reset if the ignition dwell is not within tolerance.

B. Connect tachometer to determine if idle speed is correct. If not, set to manufacturer's specifications with a tolerance of ±50 rpm.

C. With the engine idling at the correct speed, check ignition timing to determine if it is within +4° to -2° of the recommended setting, if no high altitude specifications are available.

D. Using an infrared analyzer, propane enrichment kit, and/or tachometer, adjust the idle air/fuel ratio using manufacturer's suggested procedures and specifications, if applicable.

E. After completing the preceding steps, readjust idle speed to manufacturer's specifications, if not within tolerance.

F. Using the manufacturer's suggested procedure, check the fast idle speed and adjust to manufacturer's specifications.

G. If the vehicle continues to exceed applicable emissions standards, the vehicle must undergo specific emissions related adjustments and repairs. Adjustments and repairs must be accomplished to the point of compliance, the applicable cost ceiling must have been met, and an emissions reduction must have resulted. If the applicable emissions related adjustment and repair requirements have been met but an adequate emissions reduction has not resulted, the vehicle owner is to be referred to an emissions technical center.

V. EMISSIONS RELATED REPAIRS

1. Emissions related repairs generally include only those adjustments to and maintenance and repair of the motor vehicle which are directly related to the reduction of exhaust emissions necessary to comply with the applicable emissions standards and procedures. The expenditure for emissions related repairs does not include the inspection fee as specified in C.R.S. Section 42-4-313(4)(a) (Supp. 1981), the expense of emissions related adjustments, repairs or replacements required by subpart III.E.2 or the expenses associated with the adjustments to and maintenance, replacement, and repair of air pollution control equipment on the vehicle if the need for such adjustment, maintenance, or repair is due to obvious disconnection of, tampering with, or abuse to such air pollution control equipment. Air pollution control equipment is any part, assembly or system originally installed by the manufacturer for the sole or primary purpose of reducing emissions.

2. Repairs and maintenance to the following systems shall qualify as emissions related repairs insofar as the purpose is to

reduce exhaust emissions:

—Air Intake Systems
—Ignition Systems
—Fuel Control Systems
—Emissions Control Systems
—Basic Engine Systems
—For microprocessor (0_2) based air-/fuel control systems, cooling systems.

VI. ENGINE CHANGES

A. For those vehicles in which the original engine has been replaced, the emissions standards and applicable emissions control equipment For the year and model of the vehicle body/chassis, as per registration/title; or engine, whichever is newest, shall apply. For those diesel powered vehicles which have been converted to operate on fuel(s) other than diesel; the emissions standards and applicable emissions control equipment for the year, make and model of the gasoline equivalent for the vehicle body/chasis, per the registration or engine, whichever is newest, shall apply.

B. For 1975 and newer vehicles in which the original engine has been replaced, if the vehicle body/chassis, as per registration/title; or engine, whichever is newest, as manufactured had a catalytic converter system, air injection reaction system, microprocessor based air/fuel control system, and/or fuel filler neck restrictor(S), these emission control systems must be present, intact and operational before a certification of emissions control may be issued.

C. For those vehicles titled/registered as model year 1975 and newer, that were assembled by other than a licensed manufacturer such as kit-cars, and registered-/titled according to section(s) 42-6-107-5 and/or 42-6-117, the applicable emissions control equipment will be based upon a determination by technical center personnel of the vintage of the vehicle engine. An affidavit may be issued by the technical center personnel and the year of the engine shall be presumed to be that stated by the vehicle owner unless it is determined by center personnel, after physical inspection of the vehicle entine, that the year of the engine is other than stated by the owner. The emissions standards for a vehicle of this classification will be determined by the model year of the vehicle as registered/titled.

D. In order to provide for the accurate inspection and registration coordination of motor vehicles in which the original engine has been replaced, AIR Program inspection procedures will be conducted at licensed inspection stations identified as having inspection referee and waiver authorities.

PART D

"TESTING AND LICENSING OF EMISSIONS MECHANICS

I. DEFINITIONS

Unless the context otherwise requires, the definitions in this Part D are:

A. "High Altitude Specifications" are the tune-up specifications that have been provided by the manufacturer to the Environmental Protection Agency for cars operating above 4,000 feet.

B. "Training Program" is a formal program distributed through the vocational education, adult education system, and private institutions for the dissemination of basic emission control technology, diagnosis, and repair of emissions related problems.

II. TESTING AND LICENSING OF APPLICANTS FOR EMISSIONS MECHANICS

A. Certificates of Qualification for Emissions Mechanics.

1. Applications for certificates of qualification for emissions mechanics shall be filed with the Air Pollution Control Division, 4210 East 11th Avenue, Denver, Colorado 80220, and the issuance of certificates of qualification shall be administered by the Division. Applications for such certificates of qualification shall be completed on forms provided by the Division. Before an applicant may be given a certificate of qualification, he must comply with the requirements of this Section II. The Division will notify applicants of the evaluation requirements prior to testing.

2. An applicant must demonstrate knowledge, skill, and competence concerning the conduct of emissions inspections and adjustment and repair of vehicles to manufacturer's specifications. Such knowledge, skill and competence will be shown by passing qualification test including, but not limited to, knowledge of the following:

a. Operation and purpose of emissions control systems.

b. Relationship of HC and CO to timing and air/fuel ratio control.

c. Adjustment and repair to manufacturer's and applicable high altitude specifications.

d. Rules and regulations of AIR Program inspection procedures.

e. Contemporary diagnostic and engine tune up procedures.

f. The provisions of the Emissions Control Systems Performance Warranty pursuant to Section 207(b) of the Federal Clean Air Act as it applies to the AIR Program.

g. Visual inspection of the required emissions control equipment for 1975 and newer vehicles.

h. Operation of and proper use, care, maintenance, and gas span checking of the Division-approved analyzers.

3. The Division shall issue a certificate of qualification to an applicant upon successful completion of the requirements of this Section II.

B. Requalification Requirements for All Emissions Mechanics

1. Upon the determination by the Commission of the necessity of technically updating the qualifications for emissions mechanics and, upon development or approval of retraining courses and retesting requirements for emissions mechanics to demonstrate said qualifications, emissions mechanics, or holders of certificates of qualification, shall be required to requalify.

2. Emissions mechanics shall be required to requalify within ninety (90) days from the date of written notification by the Division. Said notice shall be mailed to the address of record in the office of the Department of Revenue charged with licensing of emissions mechanics, which notice shall inform the person of the necessity of requalification and the nature of such skills, systems, and procedures requiring the retraining for the continued performance of the emissions inspection. The notice shall give the name and location of training sources approved or accredited for purposes of retraining, the necessity of requalification by a certain date, and the nature and evidence of documentation to be filed with the Division evidencing such requalification, and state

that failure to requalify within said period of time shall result in suspension or revocation of the emissions mechanic's license or certification as described in the Department of Revenue Rules and Regulations.

3. The Division shall issue a certificate of requalification to any person who has requalified to the satisfaction of the Division and according to the requalification regulation of the Department of Revenue.

C. Transmittal of Certificates and Issuance of Emissions Mechanic's Licenses. The Division shall provide a duplicate copy of any certificate of qualification or certificate of requalification to the emissions mechanic authority of the Department of Revenue, and, upon application by any person so certified or recertified, the Department of Revenue shall issue an emissions mechanic's license in accord with the regulations of that department.

D. Lapse of Certificate of Qualification for Emissions Mechanic. A person to whom the Division has issued a certificate of qualification, or certificate of requalification, who has not been issued an emissions mechanic's license within six (6) months from the date of issuance of the most recently issued certificate shall be deemed to have forfeited the said certificate and shall be required to reapply if a new certificate of qualification is requested.

PART E

Emissions Standards for Motor Vehicle Exhaust Gases:

In order for a vehicle (owner) to obtain a valid certificate of emissions compliance, the exhaust emissions from the motor vehicle subject to an annual exhaust gas emissions inspection may not exceed the following maximum concentrations for carbon monoxide (CO) and hydrocarbons (HC):

I. Light-Duty Vehicles (Includes Light-Duty Trucks)

	MAXIMUM CONCENTRATION STANDARDS	
Model Year	*Percent Carbon Monoxide*	*Parts/million Hydrocarbon*
1959 and earlier	8.0	1600
1960	7.5	1400
1961	7.5	1400
1962	7.5	1400
1963	7.5	1400
1964	7.5	1400
1965	7.5	1400
1966	7.5	1400
1967	7.5	1400
1968	6.0	1200
1969	6.0	1200
1970	6.0	1200
1971	6.0	1200
1972	5.4	1200
1973	5.4	1200
1974	5.4	1200
1975	4.4	800
1976	4.4	800
1977	3.4	500
1978	3.4	500
1979	2.0	400
1980	1.5	400
1981	1.5	400
1982	1.5	400
1983	1.5	400
1984	1.5	400
1985	1.5	400
1986	1.5	400
1987	1.5	400
1988	1.5	400

Standards for Heavy Duty Vehicles

II. Heavy-Duty Vehicles (1968-78 Greater Than 6000 Pounds GVWR)

	MAXIMUM CONCENTRATION STANDARDS	
Model Year	*Percent Carbon Monoxide*	*Parts/million Hydrocarbon*
1959 AND EARLIER	8.5	1600
1960	8.0	1600
1961	8.0	1600
1962	8.0	1600
1963	8.0	1600
1964	8.0	1600
1965	8.0	1600
1966	8.0	1600
1967	8.0	1600
1968	7.0	1400
1969	7.0	1400
1970	6.0	1400
1971	6.0	1400
1972	6.0	1400
1973	6.0	1400
1974	6.0	1400
1975	6.0	1400
1976	6.0	1400
1977	6.0	1400
1978	6.0	1400

Heavy Duty Vehicles (1979 and Newer Greater Than 8,500 Pounds GVWR)

1979	5.0	1000
1980	4.0	1000
1981	3.5	1000
1982	3.5	1000
1983	3.5	1000
1984	3.5	1000
1985	3.5	1000
1986	3.5	1000
1987	3.5	1000
1988	3.5	1000

REGULATION NO. 12

"The Reduction of Diesel Vehicle Emissions"

(Adopted December 18, 1986)

PART A — DIESEL FLEET SELF-CERTIFICATION PROGRAM

I. STATEMENT OF INTENT, DEFINITIONS, AND AREA OF APPLICATION

A. Statement of Purpose. The purpose of this regulation is to reduce air pollution resulting from emissions from diesel powered motor vehicles in the AIR Program area through opacity inspections, by all diesel Fleets registered in the AIR Program area with nine (9) or more vehicles over 7,500 lbs. empty weight.

B. Area of Application. This regulation shall apply to the AIR Program area as defined in CRS 42-4-307(11).

C. Definitions. The following terms shall have the following meanings when used in this regulation:

1. "Commission" means The Colorado Air Quality Control Commission.

2. "Compliance Plans" means A written plan of action prepared by applicable diesel vehicle fleets conforming with the requirements of this regulation.

3. "Division" means The Air Pollution Control Division of the Colorado Department of Health.

4. "Fleet" means Diesel vehicle fleet consisting of nine (9) or more diesel vehicles having empty weight of greater than 7,500 lbs., registered within the AIR Program area.

5. "Empty Weight" means weight of any motor vehicle or trailer or any combination thereof, including the operating body and accessories, as determined by weighing on a scale approved by the Department of Revenue.

6. "Opacity Compliance Coordinator" means designated person from each vehicle fleet to be the contact person between the fleet and the Division for carrying out this regulation.

7. "Opacity Determination Certification" means certification to be maintained by Opacity Compliance Coordinator for determining opacity levels. Training and certification to be conducted by Division.

II. REQUIREMENTS TO FILE COMPLIANCE PLANS.

A. Compliance Plan Requirements and Contents.

1. Every Fleet in the Area of Application with nine or more diesel vehicles of empty weights greater than 7,500 lbs. shall prepare, adopt, and submit to the Division within the time period hereinafter provided a written Compliance Plan signed by an authorized agent and containing a commitment to implement and maintain a program which meets the requirements of this regulation.

2. Each Compliance Plan shall set forth with reasonable detail a plan which shall include provisions for at least the following:

a. Dissemination of written information to all employees who maintain and/or operate diesel vehicles subject to these regulations, regarding Colorado opacity laws, penalties for non-compliance, and health and environmental impacts of diesel emissions, as provided by the Division.

b. Establishment of test procedures to be used for determining and certifying compliance with State opacity standards. Recommended test procedures will be provided by the Division.

c. Establishment of maintenance practices and schedules to be followed for maintaining low-smoke levels. Maintenance schedules at a minimum should follow manufacturer's recommended procedures and intervals.

d. Performance of bi-annual opacity compliance tests at approximately six month intervals, on each vehicle subject to these regulations; maintaining records of such test data and submit records to the Division annually by December 31, of each year.

e. Establishment of an Opacity Compliance Coordinator from each fleet to oversee the carrying out of this regulation.

f. Opacity Determination Certification to be maintained by the Opacity Compliance Coordinator, renewed annually, or a continuous reading full-flow light-extinction opacity meter with peak hold feature or chart recorder be used to determine opacity levels during vehicle testing.

B. Additional Requirement. Each Opacity Compliance Coordinator shall provide to all new employees or newly reassigned employees who work in the maintenance or operation of diesel vehicles, the most current information regarding this regulation and the Fleet's Compliance Plan within thirty (30) days of the employees commencing work. Each Opacity Compliance Coordinator shall provide updated information to all employees regarding this regulation within thirty (30) days of any substantial change to this regulation and/or the Fleet's Compliance Plan.

III. COMPLIANCE PLAN FILINGS — TIME, APPROVAL.

A. Filing of Plans. The Division shall notify each fleet in writing of the requirements of this regulation. Receipt of such notice is a condition precedent to the applicability of this regulation. Within thirty (30) days after receipt of such notification, the Fleet shall file with the Division its Compliance Plan.

B. Approval and Disapproval. The Division shall review and evaluate each Compliance Plan filed with it within thirty (30) days of its receipt by the Division. Upon approval of a Compliance Plan, the Division shall return a copy of the plan marked "approved" to the Fleet who shall post the plan in a conspicuous place in the Business Location. If a Compliance Plan as filed is disapproved by the Division, the Division shall issue a letter of disapproval, and the Fleet shall have thirty (30) days within which to revise the plan and resubmit it to the Division. The Division shall have thirty (30) days to approve or disapprove the resubmitted plan.

IV. DETERMINATION OF COMPLIANCE.

A. Inspection. The Division shall have the authority to determine a Fleet's compliance with this regulation or the Fleet's Compliance Plan by personal inspection of a Fleet's Business Location. The Division shall notify each fleet who is inspected of any violations of this regulation or the Fleet's Compliance Plan immediately upon completion of the inspections and shall be supplied with a written report of the results of the inspection within thirty (30) days of the inspection date. Such inspections by the Division may not be made more frequently than twice in any twelve (12) month period unless complaints of violation of this regulation have been received by the Division or the Division otherwise has cause to believe that the Fleet is not in compliance with the requirements of this regulation or the Fleet's Compliance Plan. Such inspections may be made by the Division only during the normal working hours of a Fleet. The time of inspection will be determined by the Division, but must be at times reasonably convenient to the Fleet. Individual vehicles of the fleet requested by the Division should be available at the time of inspection, as reasonably convenient to the fleet operators, with advance notice by the Division of such inspection.

B. Record Keeping Requirements. Opacity test results from the bi-annual inspections shall be kept by the Fleets and shall be available to the Division at inspections as described in V.A. Copies of test data shall be submitted to the Division annually by December 31 of each year. Standardized test forms shall be developed and provided by the Division.

V. PENALTIES FOR NON-COMPLIANCE.

Failure of a Fleet to comply with the requirements of this regulation will subject the Fleet to fines ranging from twenty-five (25) dollars to three hundred (300) dollars, per vehicle, per event as provided for in CRS 42-4-320 (3)(a)(b).

VI. COMMISSION RESPONSIBILITY.

By January 1, 1988, the Commission shall review and make recommendations on the effectiveness of this regulation in reducing diesel opacity. Regulation elements such as test interval, opacity standards, vehicle technology, credits for higher effective stack heights, etc., shall be included in this review.

VII. LEGISLATIVE AUTHORITY.

Authority and responsibility for the enactment of this regulation is provided for in 42-4-320.

REGULATION NO. 13

"The Reduction of Carbon Monoxide Emissions from Gasoline Powered Motor Vehicles through the use of Oxygenated Fuels"

(Adopted June 29, 1987; Amended October 20, 1988)

OXYGENATED FUELS PROGRAM

I. Statement of Intent, Area of Application, and Definitions

A. Statement of Purpose. The purpose of this regulation is to reduce carbon monoxide and particulate emissions from gasoline powered motor vehicles in the AIR Program area through the winter time use of oxygenated gasolines. The attached Statement of Basis, Statutory Authority and Purpose, and Fiscal Statement are incorporated herein, for the purpose of reference only, as Sections IV. and V., respectively.

B. Area of Application. This regulation shall apply to the AIR Program area as defined in C.R.S. 42-4-307 (11).

C. Definitions. The following terms shall have the following meaning when used in this regulation:

1. "AIR Program" means those parts or all of Colorado's Front Range counties as defined in C.R.S. 42-4-307 (11).

2. "Commission" means the Colorado Air Quality Control Commission.

3. "Division" means the Air Pollution Control Division of the Colorado Department of Health (CDH).

4. "Motor Vehicle" means any self-propelled vehicle which is designed primarily for travel on the public highways and which is generally and commonly used to transport persons and property over the public highways. For the purpose of this regulation, motor vehicles shall refer to spark ignition motor vehicles which use on a part or full time basis, gasoline or gasoline-type products.

5. "MTBE" means methyl-tert-butylether.

6. "Oxygenated Fuels" means gasolines blended with a component or components containing oxygen, generally an alcohol or ether.

7. "Class A Motor Fuel" means any gasoline type product as defined in C.R.S. 8-20-202.

8. "EPA Waiver" means any current motor fuel waivers granted by the Environmental Protection Agency under authority of the Clean Air Act, Section 211(f)(4).

Waivers for MTBE blends are contained in the Federal Register Vol. 44, pp. 12242 (March 6, 1979), and Vol. 52, No. 170, September 1, 1988.

Waivers for ethanol blends are contained in the Federal Register, Vol. 44, pp. 20777 (April 6, 1979), Vol. 47, pp. 14596 (April 5, 1982), and Vol. 47, pp. 22404 (May 24, 1982).

Waivers for methanol blends are contained in the Federal Register, Vol. 44, pp. 37074 (June 25, 1979), Vol. 45, pp. 9766 (Feb. 13, 1980), Vol. 46, No. 220, pp. 56361 (Nov. 16, 1981), Vol. 50, pp. 2615 (Jan. 17, 1985), Vol. 51, pp. 39800 (Oct. 31, 1986), Vol. 53, No. 25, pp. 3636 (Feb. 8, 1988), Vol. 53, No. 97, pp. 17977 (May 19, 1988), and Vol. 53, No. 130, pp. 25537 (July 7, 1988).

Waivers for tertiary butyl alcohol are contained in the Federal Register Vol. 44 pp. 10530 (Feb. 21, 1979), and Vol. 46, No. 220, pp. 56361 (Nov. 16, 1981).

9. "EPA 'substantially similar' ruling" refers to any gasoline blend which the Environmental Protection Agency treats as substantially similar to any unleaded gasoline utilized in the certification of 1975 model year, or subsequent model year vehicle or engine under Section 206 of the Clean Air Act, as stated in the Federal Register, Vol. 46, No. 144, pp. 38582, (July 28, 1981.)

II. REQUIREMENTS OF THE OXYGENATED FUELS PROGRAM

A. Class A Fuel Requirements

1. Beginning January 1, 1988, to March 1, 1988, no Class A motor fuel shall be supplied or sold by any person intended as a final product for fueling of motor vehicles within the AIR Program Area, or sold at retail, or sold to a private fleet for consumption, or introduced into a motor vehicle in the AIR Program area by any person, unless the fuel has at least a 1.5% oxygen content by weight. Oxygenated fuel containing 8% by volume MTBE shall be considered equivalent to 1.5% oxygen content by weight.

2. Beginning November 1, 1988, to March 1, 1989 and for each period of November 1 to March 1 thereafter, no Class A motor fuel shall be supplied or sold by any person intended as a final product for fueling of motor vehicles within the AIR Program area or sold at retail, or sold to a private fleet for consumption, or introduced into a motor vehicle in the AIR Program area by any person unless the fuel has at least a 2.0% oxygen content by weight. Oxygenated fuel containing 11% by volume MTBE shall be considered equivalent to 2.0% oxygen content by weight.

3. All oxygenated motor fuel shall be labeled at the pump during the periods stated in Sections II.A.1. and II.A.2., identifying the type and amount of oxygenate contained in the motor fuel, in accordance with labeling criteria developed by the Division consistent with any applicable law.

4. All type A motor fuel products, both leaded and unleaded, must be blended according to Environmental Protection Agency waivers or "substantially similar" ruling for unleaded fuel. Class A fuels containing lead shall be required to conform to the same waiver conditions or "substantially similar" ruling as unleaded Class A fuel with the exception that for leaded gasolines only, the maximum oxygen content which a leaded gasoline may contain and (still be considered "substantially similar") to leaded gasoline will be 2.7%.

5. The maximum amount of methanol which may be blended into gasoline is controlled by provisions contained in both the EPA's "substantially similar" ruling and EPA waivers. Methanol must be blended into all leaded and unleaded gasolines according to these provisions.

6. This regulation does not effect the blending of lead or other metallic compounds such as MMT, or other non-oxygenate compounds not required by EPA waiver or "substantially similar" ruling into leaded gasolines.

B. Reporting and Review Requirements

1. The Air Pollution Control Division, in consultation with the State Oil and Gas Inspection Section, the Environmental Protection Agency, the fuel refiners, oxygenate manufacturers, marketers and retailers, the Colorado Auto Dealers, lead air quality planning agencies, motorists and environmental organizations, shall prepare a report, to be filed with the Commission, on April 15 of each year regarding the results of the Oxygenated Fuels Program, with particular attention to a cost/benefit analysis, to include such factors as air pollution reductions obtained from the program, driveability problems, if any, the cost of the program to motor vehicle owners, refiners, marketers and retailers of the fuel, and other information which is relevant to whether the oxygenated fuels program should be continued. The Division shall also work with all appropriate entities to develop and implement a public education program.

2. At its May meeting of each year, the Commission shall consider, in light of the report and other available information,

whether the oxygenated fuels program should be modified, expanded, or terminated by rule, and the Commission shall transmit to the General assembly the report of the Division and the results of the Commission's consideration.

C. Enforcement/Penalties for Non-Compliance

Compliance with the requirements of this regulation shall be monitored and enforced by the Division. Tolerance for measurements of fuels defined in Section II.A.1. and 2. shall be determined by the Division and shall be consistent with reasonable practices. Pursuant to Section 25-7-111(f), the Division may designate any appropriate agency of the State to assist in the monitoring and enforcement of this regulation. The Division shall make every effort to coordinate monitoring and enforcement of this regulation with the current duties of the State Inspector of Oils, conducted pursuant to C.R.S. 8-20-101 et. seq.

D. Severability

The provisions of this regulation are severable, and if any provisions, or the application of the provisions to any circumstances, is held invalid, the application of such provision to other circumstances and the remainder of this regulation shall not be affected.

III. REFERENCED MATERIAL

Pursuant to C.R.S. 24-4-103 (12.5), the following materials referenced in this regulation are available for public inspection during normal working hours, or copies are available upon request at cost, from the Technical Secretary of the Air Quality Control Commission, Ptarmigan Place, 3773 Cherry Creek Drive North, 3rd floor, (303) 331-8597: C.R.S. 42-4-307 (11), C.R.S. 8-20-202, C.R.S. 8-20-204, C.R.S. 8-20-229, C.R.S. 24-4-103(12.5), C.R.S 6-4-101 et seq, C.R.S. 25-7-111(f), C.R.S. 8-20-101 et seq.

IV. STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE

The primary purpose of Regulation No. 13 is to reduce ambient levels of carbon monoxide along the Front Range of Colorado. To achieve this reduction, Regulation 13 will institute an oxygenated fuels program through out the AIR Program area during the period of January 1 to March 1 of 1988, and for each period of November 1 to March 1, thereafter. The Commission has determined that a voluntary program from November 1, 1987 through December 31, 1987 would be of great benefit to the public and will result in air quality benefits by reducing carbon monoxide, and directs the Division to proceed with coordinating and implementing such a voluntary program.

An oxygenated fuels program is a necessary step for Colorado to attain the National Ambient Air Quality Standard (NAAQS) for carbon monoxide. Of primary concern is the eight hour, long term carbon monoxide standard, which provides for an eight hour carbon monoxide limit of 9 PPM. Having more than one exceedance of this standard per year constitutes a violation of the carbon monoxide NAAQS. Areas along Colorado's Front Range, especially in Denver, have consistently failed to meet this standard.

Use of oxygenated fuels reduces carbon monoxide emissions from gasoline powered motor vehicles. The technical basis for this determination is as follows:

—Most carbon monoxide emissions along Colorado's Front Range are from motor vehicles. It is estimated that in 1987, 77% of the areas CO emissions are from motor vehicles.

—Oxygenated fuels, containing oxygen via an alcohol or ether blended with gasoline, have been shown, through testing by CDH and others, to be effective at lowering carbon monoxide emissions from motor vehicles. Reductions are directly attributable to the oxygen contained in these fuels, by leaning the air/fuel ratio.

—Most gasoline powered motor vehicles are set up to run slightly rich at sea level. Unless these vehicles are altitude compensating, they will be further enriched as the altitude increases, since there is less oxygen present.

—The amount of leaning is directly proportional to the level of oxygen contained in the fuel. The higher the percent of oxygen in the fuel, the leaner the effective air to fuel ratio will be. As the air to fuel ratio becomes leaner, CO emissions are reduced.

Thus, at Colorado's altitudes, most vehicles run richer than at sea level. This excess fuel results in less complete combustion and thus increased carbon monoxide emissions. Oxygenated fuels counteract these factors.

Since vehicles are running rich at high altitudes, the enleaning effect of oxygenated fuels is not anticipated to result in vehicle driveability degradation.

Current State law prohibits the Commission from requiring ASTM Reed Vapor Pressure (RVP) standards for ethanol blends. There is no undue concern with the lack of RVP standards on ethanol blends for the following reasons. First, Regulation No. 13 is being proposed as a wintertime only program. Volatility induced vapor lock is primarily a summertime problem. Marketing ethanol blended gasoline during the other eight months of the year would be the decision of individual fuel marketers. Second, data provided by the State Inspector of Oils indicates that the vast majority of gasoline sold in Colorado during 1986 was significantly below the applicable maximum RVP standard. In terms of ethanol blending, this implies the majority of gasoline could have been blended with ethanol and remain within RVP limits. State law C.R.S. 8-20-204, as revised July 1, 1986 is largely responsible for this lower RVP gasoline. The Commission would prefer to have appropriate ASTM RVP standards apply to all final oxygenated fuels but recognizes that the Colorado General Assembly has this prerogative

The Commission encourages and directs the Division to work with non-retail motor fuel suppliers to keep adequate records and inform purchasers of non-retail fuel regarding the amount and type of oxygenate in the fuel supplied to and in the AIR Program area.

The oxygenated fuels program provided in Regulation No. 13 will be in effect for the period of January 1 to March 1 of 1988 and for each period of November 1 to March 1, thereafter. This time period is being used for the following reasons:

— High levels of carbon monoxide are experienced in Denver and Colorado's Front Range during the winter months. For the most part exceedances of the CO standard occur between November 1 and March 1 of each winter.

— There are several environmental, climatic and geographic reasons for these high winter-time concentrations. These include a large motor vehicle fleet, traffic congestion, high altitude, cold weather and atmospheric temperature inversions.

— High CO concentrations in Colorado are brought about in part by Colorado's altitude and cold weather. At higher altitudes and colder temperatures, motor vehicles tend to have less efficient fuel combustion, resulting in increased levels of CO.

— Another cause of high carbon monoxide concentrations is the incidence of winter-time temperature inversions which can develop during the evening. An inversion will trap pollutants such as carbon monoxide near the surface. In these conditions of stagnate air, extremely high concentrations of carbon monoxide build and collect.

If the marketplace for Class A motor fuel operates in an open and competitive manner, a number of oxygenates should be available for use in the AIR Program area which, when blended with a base fuel, will produce oxygenated fuels that meet this regulation. Any attempt to limit the choice of oxygenates available in the AIR Program area between December 1 to March 1 of 1988 and for each period of November 1 to March 1, thereafter, while this regulation is in effect, through a combination, conspiracy, trust, pool, agreement or contract intended to restrain or prevent competition in the supply or price of base fuels suitable for blending with an oxygenate to produce oxygenated fuels which comply with this regulation and applicable EPA requirements, may constitute an illegal restraint of trade in violation of Section 6-4-101, et. seq. Colorado Revised Statutes.

The regulation of proper oxygenated blending practices, and the establishment of oxygenated blending specifications is necessary to prevent possible increases in evaporative or exhaust emissions from gasoline-powered motor vehicles due to the premature failure of gasoline fuel system or air pollution control components, or from the degradation of vehicle driveability which could result in increased exhaust emissions, such as from lean misfires. Adoption of standards set by the EPA and/or by the Colorado Air Quality Control Commission for blending fuel additives or blending components into gasoline would permit the Division to ensure good quality fuel is available during the oxygenated fuels program.

Authority for Regulation No. 13 can be found in the Colorado Air Quality Control Act, Section 25-7-101 et seq., C.R.S. 1982 (1986 Supp.). Specifically, Section 25-7-106(1)(e) authorizes the Colorado Air Quality Control Commission to develop "a control or prohibition respecting the use of a fuel or fuel additives in a motor vehicle to the extent authorized by Section 211(c) of the federal act". Specific authority can also be found in Section 25-7-109(3)(d).

V. FISCAL IMPACT STATEMENT

Proposed Regulation No. 13 would require the use of oxygenated fuels in the AIR Program area starting January 1 1988 to March 1 of 1988, and for each period of November 1 to March 1, thereafter. This regulation would require the use of an oxygenate such as an alcohol or an ether to be blended into gasoline.

The increase in the retail price of gasoline due to this regulation is being estimated at .05¢ to 3.5¢ per gallon. The affected AIR Program (Front Range) area consumes an estimated 1.2 billion gallons of gasoline a year. For the four month winter period oxygenates would be required each year, this would affect an estimated 380 million gallons of gasoline annually. Using the estimated high range of 3.5¢ per gallon increase, this would result in an annual cost of $13.3 million.

The cost connected with the blending of Class A gasolines, according to standards set by the EPA for the blending of fuel additives or blending components into gasoline is expected to be negligible, or have no cost. Presently all gasolines meet these requirements.

Based on Division testing, a 2% fuel economy penalty was seen for closed loop vehicles operating on oxygenated fuels. This is estimated to be 250,000 vehicles in the affected area. Assuming each vehicle is driven 4,000 miles from November 1 to March 1, each vehicle averages 25 mpg, 160 total gallons of gasoline would be consumed per vehicle. A 2% increased fuel consumption would increase consumption an additional 3.2 gallons. This results in a total increase of 800,000 gallons. At one dollar per gallon, this is an additional $800,000. This brings the total program cost to $14.1 million annually.

With both ethanol and MTBE in use in the marketplace, this regulation is estimated to result in a 300 ton per day, or 14% reduction in ambient carbon monoxide levels. This results in a cost of $128 per ton of carbon monoxide reduced.

These figures estimate increases in the retail price of gasoline, and encompass all associated costs to provide oxygenated fuels. Gasoline refiners, blenders, distributors and marketers will all have costs as a result of this regulation. Refiners may have a reduction in crude oil through-put from their refinery operations, as oxygenates will be displacing gasoline. Refiners or fuel blenders will need to purchase and blend an oxygenate into gasoline. This may require additional tankage and blending facilities in some cases. Retail fuel marketers, and private fleets with fueling facilities will need to ensure underground tanks are clean and water free before handling any alcohol blended gasoline. Final filters at the fuel pump nozzles may need to be added when dispensing alcohol blends. These costs are included in the estimates made above regarding cost per gallon increase.

It should be noted that these estimates are using the high end of retail gasoline cost estimates, and are the costs applicable to the fully implemented program, and would be less during the phase-in years. There was conflicting testimony at the public hearing regarding costs. Representatives of the petroleum industry estimated that costs of implementing the program could range up to 8.3 cents per gallon and total $49 million. These cost estimates vary so widely because an oxygenated fuel program in the AIR Program area may encourage the use of such fuels in other areas and states with carbon monoxide problems. Some owners of motor vehicles may also incur repair costs.

CONNECTICUT

CONNECTICUT MOTOR VEHICLE EMISSIONS INSPECTION ACT

(Connecticut General Statutes, Title 14 — Motor Vehicles, Chapter 246 — Motor Vehicles — VII General Provision, Section 14-100b; Enacted by Public Act 67-676; Amended PA 71-872; Chapter 246a — Motor Vehicle Emissions; Enacted by Public Act 78-335; Amended PA 79-238; PA 80-458; PA 82-460; PA 83-561; PA 84-11; PA 85-484)

Administering Agency: Department of Motor Vehicles
60 State Street
Wethersfield, Conn. 06109

Chapter 246

14-100b. Air pollution control devices required on certain passenger motor vehicles

On and after January 1, 1968, no passenger motor vehicle designated as a 1968 or later model shall be registered in this state unless equipped with an effective air pollution control device. The commissioner of environmental protection with the advice of the commissioner of motor vehicles, may make regulations establishing standards for such devices, which standards shall be consistent with provisions of federal law, if any, relating to control of emissions from the vehicles concerned. The commissioner of motor vehicles shall not require, as a condition precedent to the initial sale of a vehicle or vehicular equipment, the inspection, certification or other approval of any feature or equipment designed for the control of emissions from motor vehicles if such feature or equipment has been certified, approved or otherwise authorized pursuant to federal law.

Chapter 246a

14-164b. Definitions

For the purposes of this chapter, the following words and terms shall be construed as follows, unless another meaning is clearly apparent from the language or context:

(1) "Commissioner" means the commissioner of motor vehicles.

(2) "Fleet" means a group of twenty-five or more owned or leased motor vehicles subject to emissions inspection pursuant to subsection (c) of section 14-164c owned or leased by one person, firm, corporation, or governmental entity.

(3) "Fleet emissions inspection station" means an inspection station owned or leased by the owner or operator of a fleet and licensed by the commissioner for conducting emission inspections of fleet vehicles.

(4) "Independent contractor" means any person, business, firm, partnership or corporation with whom the commissioner may enter into an agreement providing for the leasing, construction, equipping, maintaining, staffing, management or operation of official emissions inspection stations pursuant to this chapter.

(5) "Official emissions inspection station" means an exhaust emissions inspection facility, whether placed in a permanent structure or in a mobile unit for conveyance among various locations within this state, for the purpose of conducting exhaust emissions inspections of all vehicles required to be inspected pursuant to this chapter.

§14-164c. Motor vehicle emissions systems. Emissions standards and inspections. Inspection facilities. Fees. Penalty

(a) No person shall fail to maintain in good working order or remove, dismantle or otherwise cause to be inoperative any equipment or feature constituting an operational element of the air pollution control system or mechanism of a motor vehicle required by regulations of the commissioner of environmental protection to be maintained or on the vehicle. Any such failure to maintain in good working order or removal, dismantling or causing of inoperability shall subject the owner thereof to revocation of registration for such vehicle by the commissioner of motor vehicles unless all parts and equipment constituting elements of air pollution control have been made operable and in good working order within thirty days of notice by said commissioner of such violation. As used in this section, motor vehicle shall have the same meaning as is provided in section 14-1.

(b) The commissioner of environmental protection shall consult with the commissioner of motor vehicles and furnish him with technical information, including testing techniques, standards and instructions for emission control features and equipment. On or before November 1, 1979, the commissioner of environmental protection shall furnish the commissioner of motor vehicles with a definition of minimum exhaust emission standards for all gasoline-power vehicles designated as a 1968 or later model. Such standards shall be consistent with provisions of federal law, if any, relating to control of exhaust emissions from the vehicles concerned. Such standards shall be periodically reviewed by the commissioner of environmental protection and revised, if necessary, to achieve the objectives of the vehicle emission inspection program.

(c) The commissioner, on or before November 1, 1979, shall adopt rules and regulations which require an annual exhaust emissions inspection and compliance or waiver with exhaust emission standards defined by the commissioner of environmental protection for all motor vehicles registered or which will be registered in this state except: (1) Vehicles having a gross weight of more than ten thousand pounds; (2) vehicles powered by a fuel other than gasoline; (3) bicycles with motors attached; (4) motorcycles; (5) vehicles operating with a temporary registration; (6) vehicles manufactured before the 1968 model year; (7) new vehicles at the time of initial registration; (8) vehicles registered by not designed primarily for highway use; (9) farm vehicles, as defined in subsection (q) of section 14-49. The commissioner may require emissions inspection and compliance or waiver prior to completion of the sale and registration of a motor vehicle over one year old.

(d) The commissioner shall provide for the commencement of vehicle emissions inspections on December 31, 1982, and provide for the initial emissions inspections during 1983 of all motor vehicles required to be inspected pursuant to this chapter. After December 31, 1982, no such motor vehicle shall be operated upon the highways of this state unless such vehicle has evidence of annual inspection and compliance with subsection (c) of this section in accordance with a schedule for inspection and compliance as established by the commissioner. The commissioner shall grant waivers from compliance with standards for vehicles which fail emissions inspection and require an unreasonable cost of repair to bring the vehicle into compliance. The commissioner shall prescribe minimum repair requirements, not to exceed a cost of forty dollars, as a condition of waiver from compliance for a vehicle which would require an unreasonable cost of repair to bring such vehicle into compliance. The Commissioner shall design a sticker to be affixed to the windshield of such vehicle which shall bear the date of expiration of the assigned inspection period on both sides. As used in this section, "unreasonable cost of repair" means cost of repair of forty dollars or more except that it does not include the cost or repair or replacement of any air pollution control device required by state or federal law which has been removed, dismantled or caused to be inoperative.

(e) In order to provide for emissions inspection facilities, the commissioner shall enter into a negotiated inspection agreement or agreements, notwithstanding chapters 50, 51, and 51a, with an independent contractor or contractors, to provide for the leasing, construction, equipping, maintenance or operation of a system of official emissions inspection stations in such numbers and locations as may be required to provide vehicle owners reasonably convenient access to inspection facilities. The commissioner shall consider the possibility that such system shall be employed to conduct safety as well as emissions inspections at a future date. The commissioner is prohibited from entering into an inspection agreement with any independent contractor who: (1) Is engaged in the business of maintaining or repairing vehicles in this state, except that the independent contractor shall not be precluded from maintaining or repairing any vehicle owned or operated by the independent contractor; (2) does not have the capability, resources or technical and management skill to adequately conduct, equip, operate and maintain a sufficient number of official emissions inspection stations. All persons employed by the independent contractor in the performance of an inspection agreement are deemed to be employees of the independent contractor and not of this state. The inspection agreement or agreements authorized by this section shall be subject to other provisions as follows: (A) Contracts for performance of testing for a minimum term of five years; (B) minimum requirements for staff, equipment, management and hours and place of operation of official emissions inspection stations; (C) reports and documentation concerning the operation of official emissions inspection stations as the commissioner may require; (D) surveillance privileges for the commissioner to ensure compliance with standards, procedures, rules, regulations and laws; and (E) any other provision deemed necessary by the commissioner for the administration of the inspection agreement. Nothing in the inspection agreement shall require the state to purchase any asset or assume any liability if such agreement is not renewed.

(f) The commissioner may license an owner or operator of a fleet of twenty-five or more motor vehicles which are subject to emissions inspection pursuant to subsection (c) of this section to establish a fleet emissions inspection station, provided that the fleet owner or operator conforms with regulations for fleet emissions inspection stations adopted by the commissioner.

(g) The commissioner, with approval of the secretary of the office of policy and management, shall establish, and from time to time modify, the inspection fees, not to exceed ten dollars per inspection, required pursuant to this chapter for inspections performed at official emissions inspection stations. If the costs to the state of the emissions inspection program, including administrative costs and payments to any independent contractor, exceed the income from such inspection fees, such excess costs shall be borne by the state. Any person whole vehicle has been inspected at an official emissions inspection station shall, if such vehicle is found not to comply with the minimum standards, have the vehicle repaired and have the right within thirty consecutive calendar days to return such vehicle for one reinspection without charge, provided, where the thirieth day falls on any day when the official emissions inspection station is closed for business, such person may return his vehicle for reinspection on the next day on which such station is open for business. The commissioner, with approval of the secretary of the office of policy and management, shall establish, and from time to time modify the fees, required pursuant to this chapter for inspection performed at fleet emissions inspection stations. Such fees shall reflect the costs to the state of administering and supervising such inspection activities.

(h) The commissioner may acquire in the name of the state by purchase, lease, gift, device or otherwise any special equipment, tools, materials or facilities needed to adequately administer, investigate or enforce the provisions of this chapter.

(i) A person shall not in any manner represent any place to be an official emissions inspection station unless such station has been established and is operated under a valid inspection agreement with the commissioner.

(j) After December 31, 1982, no person, firm or corporation shall operate or allow to be operated any motor vehicle that has not been annually inspected and found to be in compliance with the provisions of subsections (c) and (d) and the rules and regulations adopted by the commissioner. Operation in violation of subsections (c) and (d) and the rules and regulations adopted by the commissioner shall be an infraction for each violation, except that the fine for a fisrt violation shall be thirty-five dollars, and the certificate of registration and number plates shall be returned to the commissioner upon demand therefor. Any moneys paid for the same shall be forfeited to the state.

14-164d. [Repealed]

14-164e. [Repealed.]

14-164f. Severable provisions

The provisions of this chapter are severable. If any part of this chapter is declared invalid or unconstitutional, such declaration shall not affect the part which remains.

14-164g. Review of inspection agreement by legislative committee

On or before January 1, 1981, any inspection agreement or agreements negotiated by the commissioner shall be submitted to the clerk of the house and the clerk of the senate for review by a committee consisting of five members of the house, three of whom shall be appointed by the speaker of the house of representatives and two of whom shall be appointed by the minority leader of the house of representatives, and five members of the senate, three of whom shall be appointed by the president pro tempore of the senate and two of whom shall be appointed by the minority leader of the senate. Said committee shall, within forty-five days, approve or reject such agreement or agreements as a whole by a majority vote of those present and voting. If rejected, such agreement or agreements shall be returned to the commissioner for further action.

14-164h. Report to transportation committee re operation of program

(a) The commissioner of motor vehicles shall report to the joint standing committee of the general assembly having cognizance of matters relating to the department of motor vehicles, concerning the operation of the motor vehicle emissions inspection program, not later than the fifteenth business day of each month. The report shall include, but not be limited to, the following information: Compliance records, the number of vehicles passing and failing emissions inspections, the number of vehicles receiving waivers from compliance with emission standards, the number of vehicles inspected at each station, any information provided by the independent contractor to the department of motor vehicles, enforcement proceedings employed against those who fail to comply with exhaust emission standards, and any problems concerning the operation of the program.

(b) The commissioner of environmental protection shall report to said committee concerning (1) emissions reductions resulting from the operation of the inspection program, not later than the fifteenth business day of January, April, July and October, annually, and (2) air quality in the state, not later than the first day of September, annually.

CHAPTER 5. MONITORING DEVICES

42700. The Legislature hereby finds and declares that stationary sources of air pollution are known to emit significant amounts of pollutants into the air, but that existing sampling techniques are not sufficiently precise to permit accurate measurement. The Legislature further finds and declares that more accurate data will improve the design of strategies for the control of such pollutants in the most cost-effective manner.

The Legislature further finds and declares that public complaints about excessive emissions from stationary sources are difficult or impossible to evaluate in the absence of adequate means of monitoring such emissions on a continuing basis. The Legislature further finds and declares that, although the state board and the districts are authorized under Section 41511 and 42303, to require stationary sources of air contaminants to install and operate monitoring devices to measure and record continuously the emissions concentration and amount of any specified pollutant, many districts have failed to exercise such authority.

The Legislature further finds and declares that all districts, especially the bay district, the districts located, in whole or part, within the South Coast Air Basin, and the San Diego County Air Pollution Control District should be encouraged to require that monitoring devices be installed in each stationary source of air contaminants which emits into the atmosphere 100 tons or more each year of nonmethane hydrocarbons, oxides of nitrogen, oxides of sulfur, reduced sulfur compounds, or particulate matter or 1,000 tons or more each year of carbon monoxide.

In order to encourage such action by the districts, the state board shall determine the availability, technological feasibility, and economic reasonableness of monitoring devices for such stationary sources as provided by Section 42701.

42701. (a) For the purposes of Sections 41511 and 42303, the state board shall determine the availability, technological feasibility, and economic reasonableness of monitoring devices to measure and record continuously the emissions concentration and amount of nonmethane hydrocarbons, oxides of nitrogen, oxides of sulfur, reduced sulfur compounds, particulate matter, and carbon monoxide emitted by stationary sources. Such determination shall be made for stationary sources which emit such contaminants in the quantities set forth in Section 42700, and may be made for stationary sources which emit lesser amounts. The state board shall complete an initial review of submitted devices by June 1, 1975.

42702. The state board shall specify the types of stationary sources, processes, and the contaminants, or combinations thereof, for which a monitoring device is available, technologically feasible, and economically reasonable. Such specification may be by any technologically based classification, including on an industry-wide basis or by individual stationary source, by air basin, by district, or any other reasonable classification.

42703. The state board shall require the manufacturer of any monitoring device submitted for a determination to reimburse the state board for its actual expenses incurred in making the determination, including, where applicable, its contract expenses for testing and review.

42704. After the board has made a determination of availability, the state board may, as appropriate, revoke or modify its prior determination of availability if circumstances beyond the control of the state board, or of a stationary source required to install a monitoring device, cause a substantial delay or impairment in the availability of the device or cause the device no longer to be available.

42705. Any stationary source required by the district in which the source is located to install and operate a monitoring device shall retain the records from the device for not less than two years and, upon request, shall make the records available to the state board and the district.

42706. Any violation of any emission standard to which the stationary source is required to conform, as indicated by the records of the monitoring device, shall be reported by the operator of the source to the district within 96 hours after such occurrence. The district shall, in turn, report the violation to the state board within five working days after receiving the report of the violation from the operator.

42707. The air pollution control officer shall inspect, as he determines necessary, the monitoring devices installed in every stationary source of air contaminants located within his jurisdiction required to have such devices to insure that such devices are functioning properly. The district may require reasonable fees to be paid by the operator of any such source to cover the expense of such inspection and other costs related thereto.

42708. This chapter shall not prevent any local or regional authority from adopting monitoring requirements more stringent than those set forth in this chapter or be construed as requiring the installation of monitoring devices on any stationary sources or classes of stationary sources. This section shall not limit the authority of the state board to require the installation of monitoring devices pursuant to Chapter 1 (commencing with Section 41500).

PART 5. VEHICULAR AIR POLLUTION CONTROL

CHAPTER 1. GENERAL PROVISIONS

43000. The Legislature finds and declares:

(a) That the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state.

(b) That the control and elimination of those air pollutants is of prime importance for the protection and preservation of the public health and well-being, and for the prevention of irritation to the senses, interference with visibility, and damage of vegetation and property.

(c) That the state has a responsibility to establish uniform procedures for compliance with standards which control or eliminate such air pollutants.

(d) That vehicle emission standards applied to new motor vehicles, and to used motor vehicles equipped with motor vehicle pollution control devices, are standards with which all vehicles shall comply.

43000.5. The Legislature further finds and declares:

(a) That despite the significant reductions in vehicle emissions which have been achieved in recent years, continued growth in population and vehicle miles traveled throughout California have the potential not only to prevent attainment of the state standards, but in some cases, to result in worsening of air quality.

(b) That the attainment and maintenance of the state air quality standards will necessitate the achievement of substantial reductions in new vehicle emissions and substantial improvements in the durability of vehicle emissions systems.

(c) That the burden for achieving needed reductions in vehicle emissions should be distributed equitably among various classes of vehicles, including both on- and off-road vehicles, light-duty cars and trucks, and heavy-duty vehicles, to accomplish improvements in both the emissions level and in-use performance and durability of all new motor vehicles.

(d) That the state board should take immediate action to implement both short- and long-range programs of across-the-board reductions in vehicle emissions which can be relied upon by the districts in the preparation of their attainment plans or plan revisions pursuant to Sections 40911, 40902, and 40925.

(e) That in order to attain the state and federal standards as expeditiously and equitably as possible, it is necessary for the authority of the state board to be clarified and expanded with respect to the control of motor vehicles and motor vehicle fuels.

43001. The provisions of this part shall not apply to any of the following:

(a) Racing vehicles.

(b) Motorcycles, except as otherwise provided in Section 43107.

(c) Implements of husbandry, as defined in Chapter 1 (commencing with Section 36000) of Division 16 of the Vehicle Code.

This section shall remain in effect only, until January 1, 1989, and as of that date is repealed, unless a later enacted statute, which is chaptered before January 1, 1989, deletes or extends that date.

43001. The provisions of this part shall not apply to:

(a) Racing vehicles.

(b) Motorcycles, except as otherwise provided in Section 43107.

This section shall become operative on January 1, 1989.

43002. No motor vehicle of historic interest shall be required to have any motor vehicle pollution control device, except for such devices that were required by this part for such vehicles prior to the time that special identification plates were issued for that vehicle pursuant to Section 5004 of the Vehicle Code.

43002.2. The state board shall waive the provisions of this division on a case-by-case basis for the purpose of allowing the importation of vehicles designed only for use for disabled persons.

43002.5. [Repealed]

43003. [Repealed]

43004. Except as otherwise provided in Section 43001, 43002, or 43005, the standards applicable under this part for exhaust emissions for gasoline-powered motor vehicles shall apply to motor vehicles which have been modified or altered to use a fuel other than gasoline or diesel.

43005. Section 43004 of this code, and Sections 4000.1 and 27156 of the Vehicle Code, shall not apply to a motor vehicle altered or modified to use a fuel other than gasoline or diesel completed prior to August 31, 1969.

43006. The state board may certify the fuel system of any motor vehicle powered by a fuel other than gasoline or diesel which meets the standards specified by Section 43004 and adopt test procedures for such certification.

43007. Whenever any motor vehicle is required to be equipped with any motor vehicle pollution control device by rules and regulations adopted by any district pursuant to Section 43658, such motor vehicle shall be equipped with such device.

43008. Except as provided by Sections 43100 and 43101 and Chapter 3 (commencing with Section 43600), all motor vehicles required pursuant to the National Emission Standards Act (42 U.S.C., Secs. 1875f-1 to 1857f-7, inclusive) and the standards and regulations promulgated thereunder, to be equipped with motor vehicle pollution control devices, shall be equipped with such devices required by that act.

43009. Except as otherwise provided in Section 43002, every motor vehicle subject to this part shall meet the standards adopted by the state board pursuant to Sections 27157 and 27157.5 of the Vehicle Code.

43009.5. (a) If, based on a review of information derived from a statistically valid and representative sample of vehicles, the state board determines that a substantial percentage of any class or category of vehicles certified under the optional standards of Section 43101.5, and of Section 1960.15 of Title 13 of the California Administrative Code, exhibits, prior to 75,000 miles or seven years, whichever occurs first, an identifiable, systematic defect in a component listed in paragraph (2) of subdivision (c) of Section 1960.15, which causes a significant increase in emissions above those exhibited by vehicles free of defects and of the same class or category and having the same period of use and mileage, the state board may invoke its enforcement authority under Section 43105 to require remedial action by the vehicle manufacturer. The remedial action shall be limited to owner notification and repair or replacement of the defective component. As used in this section, the term "defect" shall not include failures which are the result of abuse, neglect, or improper maintenance.

(b) Nothing in this section shall limit or otherwise affect the recall authority of the state board, except as provided in subdivision (a).

43010. With respect to the program designed and adopted by the Department of Consumer Affairs pursuant to Chapter 20.4 (commencing with Section 9889.50) of Division 3 of the Business and Professions Code, the state board shall, in time for the Department of Consumer Affairs to comply with the schedule specified in subdivisions (a) and (b) of Section 9889.55 of that code, after public hearings, prescribe maximum air pollution emission standards to be applied in inspecting motor vehicles.

In prescribing such standards, the state board shall undertake such studies and experiments as are necessary and feasible, evaluate available data, and confer with automotive engineers.

The standards shall be set at a level reasonably achievable for each class and model of motor vehicle when operating in a reasonably sound mechanical condition, allowing for the effects of installed motor vehicle pollution control devices, and the motor vehicle's age and total mileage. The standard shall be designed to secure the operation of all such motor vehicles, as soon as possible, with a substantial reduction in air pollution emissions, and shall be revised from time to time, as experience justifies.

43011. (a) The state board shall establish criteria for the evaluation of the effectiveness of motor vehicle pollution control devices. After the establishment of such criteria, the state board shall evaluate motor vehicle pollution control devices which have been submitted to it for testing.

(b) The criteria established by the state board pursuant to subdivision (a) shall include, but need not be limited to:

(1) Provisions for the testing of vehicles on which a device is installed, when an engineering evaluation of the device indicates such testing is warranted.

(2) A requirement that independent test data be supplied to the state board for each device it is requested to test.

43012. (a) For the purpose of enforcing or administering any federal, state, or local law, order, regulation, or rule relating to vehicular sources of emissions, the executive officer of the state board or an authorized representative of the executive officer, upon presentation of credentials or, if necessary under the circumstances, after obtaining an inspection warrant pursuant to Title 13 (commencing with Section 1822.50) of Part 3 of the Code of Civil Procedure, has the right of entry to any premises owned, operated, used, leased, or rented by any new or used car dealer, as defined in Sections 285, 286, and 426 of the Vehicle Code, for the purpose of inspecting any vehicle for which emissions standards have been enacted or adopted or for which emissions equipment is required and which is situated on the premises for the purpose of emission-related maintenance, repair, or service, or for the purpose of sale, lease, or rental whether or not the vehicle is owned by the dealer. The inspection may extend to all emission-related parts and operations of the vehicle, and may require the on-premises operation of an engine or vehicle, the on-premises securing of samples of emissions from the vehicle, and the inspection of any records which relate to vehicular emissions required by the Environmental Protection Agency or by any state or local law, order, regulation, or rule to be maintained by the dealer in connection with the dealer's business.

(b) The right of entry for inspection under this section is limited to the hours during which the dealer is open to the public, except when the entry is made pursuant to warrant or whenever the executive officer or an authorized representative has reasonable cause to believe that a violation of any federal, state, or local law, order, regulation, or rule has been committed in his or her presence. No vehicle shall be inspected pursuant to this section more than one time without an inspection warrant or without reasonable cause unless the vehicle undergoes a change of ownership or the inspection reveals that the vehicle has failed to comply with required emissions standards or equipment, in which case one additional inspection may be made to verify the violation or to verify that the violation has been corrected.

(c) With respect to vehicles not owned by the dealer, the state board may not prosecute, without the owner's knowledge or consent, any violation by the owner of any law pertaining to vehicular emissions unless prior notice of the inspection has been given to the owner.

(d) If the executive officer or authorized representative, upon inspection, finds that a used motor vehicle fails to comply with applicable emissions standards or equipment, the state board shall issue a notice to correct. Until all violations in the notice have been corrected and the dealer has sent proof of correction by certified mail to the state board, the motor vehicle shall prominently display the following disclosure affixed to the windshield in at least 18-point type:

NOT FOR SALE

THIS VEHICLE IS PRESENTLY NOT IN COMPLIANCE WITH THE CALIFORNIA VEHICLE POLLUTION CONTROL LAWS AND MAY NOT BE SOLD UNTIL A VALID CERTIFICATE OF COMPLIANCE HAS BEEN ISSUED.

Any dealer who sells a vehicle prohibited to be sold under this subdivision is subject to a civil penalty of not to exceed one thousand dollars ($1,000). For purposes of this subdivision, "proof of correction" shall consist of a copy of a certificate of compliance or noncompliance issued following the issuance of a notice to correct by a licensed test station or licensed repair station not affiliated with or owned by the dealer or any other proof of repair satisfactory to the inspecting officer. The dealer shall send the copy of the certificate of compliance or noncompliance by certified mail to the state board within three days of obtaining the certificate.

(e) Civil penalties may be assessed or recovered for one or more violations by a dealer involving the tampering with or disabling of a vehicles' air injection, exhaust gas recirculation, crankcase ventilation, fuel injection, or carburation systems, ignition timing or evaporative controls, fuel filler neck restrictor, oxygen sensor or electronic controls, or missing catalytic converter.

(f) No civil penalty or criminal penalty may be assessed for a violation by a dealer identified in a notice to correct as a result of an inspection under this section if the violation is related to lack of maintenance or customer tampering or vandalism, including, but not limited to, a missing gasoline filler cap and a disconnected or missing heated air intake tube or vacuum hose. However, if notices to correct are issued under this subdivision to more than 20 percent of the vehicles offered for sale on a dealer's premises during each of three consecutive inspections conducted 30 or more days apart during any one-year period, civil penalties may be assessed and recovered for each vehicle issued a notice to correct.

(g) If the executive officer or authorized representative, upon inspection, finds that a certificate of compliance or noncompliance was issued to a motor vehicle that fails to comply with applicable emissions standards or equipment, the state board shall immediately refer these findings to the department for investigation under Chapter 5 (commencing with Section 44000). The state board may refer any other suspected violation to the department for appropriate action.

(h) Notwithstanding Section 17150 of the Vehicle Code, the state shall be liable for any injury or damage caused by the negligent or wrongful act or omission of the operator of any vehicle which is operated pursuant to this section.

(i) This section provides the exclusive authority for inspections of motor vehicles for the purposes specified in this section.

(j) As used in this section, the terms "tampering" and "disabling" mean an unauthorized modification, alteration, removal, or disconnection.

(k) No civil penalty may be imposed, or administrative action taken to revoke a dealer's license, for any violation of this section involving a used motor vehicle occurring between January 1, 1988, and March 31, 1988.

43013. (a) The state board may adopt and implement motor vehicle emission standards, in-use performance standards, and motor vehicle fuel specifications for the control of air contaminants and sources of air pollution which the state board has found to be necessary, cost-effective, and technologically feasible to carry out the purposes of this division.

(b) The state board may, consistent with subdivision (a), adopt standards and regulations for light-duty and heavy-duty motor vehicles; medium-duty motor vehicles, as determined and specified by the state board; motorcycles; off-highway vehicles; construction equipment; farm equipment; utility engines; locomotives; and, to the extent permitted by federal law, marine vessels.

(c) Prior to adopting standards and regulations for farm equipment, the state board shall hold a public hearing and find and determine that the standards and regulations are necessary, cost-effective, and technologically feasible. The state board shall also consider the technological effects of emission control standards on the cost, fuel consumption, and performance characteristics of mobile farm equipment.

(d) Notwithstanding subdivision (b), the state board shall not adopt any standard or regulation affecting locomotives until the final study required under Section 5 of Chapter 1326 of the Statutes of 1987 has been completed and submitted to the Governor and Legislature.

43014. The state board may issue permits for the testing of experimental motor vehicle pollution control devices installed in used motor vehicles, or for the testing of experimental or prototype motor vehicles which appear to have very low emission characteristics.

43015. The Air Pollution Control Fund is continued in existence in the State Treasury. Upon appropriation by the Legislature, the money in the fund shall be available to the state board to carry out its duties and functions.

43016. Any person who violates any provision of this part, or any order, rule, or regulation of the state board adopted pursuant to this part, and for which violation there is not provided in this part any other specific civil penalty or fine, shall be subject to a civil penalty of not to exceed five hundred dollars ($500) per vehicle. Any penalty collected pursuant to this section shall be payable to the State Treasurer for deposit in the Air Pollution Control Fund.

43017. The state board may enjoin any violation of any provision of this part, or of any order, rule, or regulation of the state board, in a civil action brought in the name of the people of the State of California, except that the state board shall not be required to allege facts necessary to show, or tending to show, lack of adequate remedy at law or to show, or tending to show, irreparable damage or loss.

43018. (a) The state board shall endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state standards at the earliest practicable date.

(b) Not later than January 1, 1992, the state board shall take whatever actions are necessary, cost-effective, and technologically feasible in order to achieve, not later than December 31, 2000, a reduction in the actual emissions of reactive organic gases of at least 55 percent, a reduction in emissions of oxides of nitrogen of at least 15 percent from motor vehicles. These reductions in emissions shall be calculated with respect to the 1987 baseline year. The state board also shall take action to achieve the maximum feasible reductions in particulates, carbon monoxide, and toxic air contaminants from vehicular sources.

(c) In carrying out this section, the state board shall adopt standards and regulations which will result in the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuel, including, but not limited to, all of the following:

(1) Reductions in motor vehicle exhaust and evaporative emissions.

(2) Reductions in emissions from in-use emissions from motor vehicles through improvements in emission system durability and performance.

(3) Requiring the purchase of low-emission vehicles by state fleet operators.

(4) Specification of vehicular fuel composition.

(d) In order to accomplish the purposes of this division, and to ensure timely approval of the district's plans for attainment of the state air quality standards by the state board, the state board shall adopt the following schedule for workshops and hearings to consider the adoption of the standards and regulations required pursuant to this section:

(1) Workshops on the adoption of vehicular fuel specifications for aromatic content, diesel fuel quality, light-duty vehicle exhaust emission standards, and revisions to the standards for new vehicle certification and durability to reflect current driving conditions and useful vehicle life shall be held not later than March 31, 1989. Hearings of the state board to consider adoption of proposed regulations pursuant to this subdivision shall be held not later than November 15, 1989.

(2) Workshops on the adoption of regulations governing, gasoline Reid Vapor Pressure, and standards for heavy-duty and medium-duty vehicle emissions, shall be held not later than January 31, 1990. Hearings of the state board to consider adoption of proposed regulations pursuant to this subdivision shall be held not later than November 15, 1990.

(3) Workshops on the adoption of regulations governing detergent content, emissions from off-highway vehicles, vehicle fuel composition, emissions from construction equipment and farm equipment, motorcycles, locomotives, utility engines, and to the extent permitted by federal law, marine vessels, shall be held not later than January 31, 1991. Hearings of the state board to consider adoption of proposed regulations pursuant to this subdivision shall be held not later than November 15, 1991.

43019. The state board may adopt, by regulation, a schedule of annual fees for the certification of motor vehicles and en-

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years to meet the requirement for the application of best available control technology through use of a demonstrated system of control.

REGULATION NO. 26

MOTOR VEHICLE EMISSIONS INSPECTION PROGRAM

Section 1 — Applicability and General Provisions

1.1 Except as provided in Section 4 of this regulation, the standards, requirements and procedures set forth in this regulation are applicable to all motor vehicles titled and registered within the emissions inspection area and as specified by the Department, including any motor vehicles owned or operated by the federal, state and local governments and their agencies.

Section 2 — Definitions

Division: The Division of Motor Vehicles in the Department of Public Safety of the State of Delaware.

Waiver: An exemption issued to a motor vehicle that cannot comply with the applicable emissions standard and cannot be repaired for reasonable cost.

Department: The Department of Natural Resources and Environmental Control of the State of Delaware.

Emissions: Products of combustion discharged into the atmosphere from the tailpipe of a motor vehicle engine.

Emissions Inspection Area: That portion of the State where the national ambient air quality standard for ozone is exceeded, and an emission inspection program is required by the United States Environmental Protection Agency under the authority of the Clean Air Act, 42 U.S.C. 1957, et seq., as amended. The emissions inspection area is the County of New Castle in the State of Delaware.

Exempt Areas: Jurisdictions of this State that are not subject to the emissions inspection requirements of this regulation. The exempt areas are Kent and Sussex Counties in the State of Delaware.

Emissions Standard(s): The maximum concentration of either hydrocarbons (HC) or carbon monoxide (CO), or both, allowed in the emissions from the tailpipe of a motor vehicle as established by the Secretary of the Department of Natural Resources and Environmental Control or his designee in Technical Memorandum #2 entitled "Motor Vehicle Inspection and Maintenance Program —— Emission Limit Determination", dated 5/9/85.

Failed Motor Vehicle: Any motor vehicle which does not comply with applicable emission standards during the initial test or any retest.

Fleet Inspection Station: A facility approved by the Division to conduct emissions inspections of the motor vehicles of a qualified fleet as determined by the Division.

Model Year: The year of manufacture of a vehicle as designated by the manufacturer, or the model year designation assigned by the Division to a vehicle constructed by other than the original manufacturer.

Motor Vehicle: Includes every vehicle, as defined in 21 *Del. Code*, Section 101, which is self-propelled, except farm tractors and off-highway vehicles.

Motor Vehicle Officer: A person who has completed an approved emissions inspection equipment training program and is employed by an official inspection station.

New Motor Vehicle: A motor vehicle of the current or preceding model year that has never been previously titled or registered in this or any other jurisdiction and whose ownership document remains as a manufacturer's certificate of origin.

Official Inspection Station: The Motor Vehicle Safety Inspection Stations in Wilmington and near New Castle, Delaware, operated by the Division.

Reasonable Cost: The actual cost of only parts and labor, not exceeding $75.00, which are necessary to cause the failed motor vehicle to comply with applicable emissions standards or which contribute toward compliance. It shall not include the cost of those repairs determined by the Division to be necessary due to alteration or removal of any part of the emission control system of the motor vehicle, or due to any damage resulting from the use of improper fuel in the failed motor vehicle.

Registered Gross Vehicle Weight (G.V.W.): The vehicle gross weight designated by the Division on the vehicle registration card which is the total weight of the vehicle and its maximum allowable load.

Vehicle: Means every device in, upon or by which any person or property is or may be transported or drawn upon a public highway, excepting devices moved by human power or used exclusively upon stationary rails or tracks and excepting off-highway vehicles.

Section 3 — Registration Requirement

3.1 Effective January 1, 1983, no motor vehicle that is subject to this regulation may be granted registration in the State of Delaware unless the motor vehicle is in compliance with the applicable emissions standards, regardless of its pass/fail status of other tests normally performed at the official inspection station.

Section 4 — Exemptions

4.1 The following motor vehicles are exempt from the provisions of this regulation:

a. All farm vehicles displaying class FT (farm truck registration).

b. All historic or antique vehicles displaying antique vehicle registration plates.

c. All motor vehicles with a registered G.V.W. over 8,500 pounds.

d. All motorcycles.

e. All vehicles that are registered in Delaware, but are not operated in Delaware consistent with established procedures of the Division.

f. All vehicles that obtain power by a means other than gasoline internal combustion. (Example: diesel, electric, propane, etc.)

g. All vehicles that are registered in Delaware to a bonafide domicile that is outside of the emissions inspection area as defined.

4.2 Any exemption issued to a vehicle under this Section will not have an expiration date and will expire only upon a change in the vehicle status for which exemption was initially granted.

Section 5 — Enforcement

5.1 Enforcement shall be in accordance with the provisions of 7 *Del. C.*, Chapter 67.

Section 6 — Compliance, Waivers and Extensions of Time

6.1 Compliance with applicable emissions standards shall be determined at an official inspection station or at a fleet inspection station. The idle test procedure prescribed by the Department in a Technical Memorandum #1 entitled "Motor Vehicle Inspection and Maintenance Program — Vehicle Test Procedure and Machine Calibration", dated 6/9/82, shall be the official test procedure. As pass/fail printout from the emission testing equipment given to the driver will serve as the driver's record of the test results.

a. Any motor vehicle shall be deemed to be in compliance with Section 3.1 if the test results are equal to or less than the emissions standards applicable to the motor vehicle.

b. Except as provided in Section 6.1(c), any motor vehicle shall be deemed to be in noncompliance with Section 3.1 if the test results are greater than the emissions standards applicable to the motor vehicle.

c. Any motor vehicle which fails its initial emissions test shall be deemed to be in compliance with Section 3.1 if not later than the last day of the month on which its registration expires, the motor vehicle either (1) is repaired at reasonable cost and is in compliance with applicable emissions standards as determined by an emissions retest at an Official Inspection Station, or (2) is granted a waiver pursuant to Section 6.1e, or (3) is granted an extension of time pursuant to Section 6.1d.

d. Whenever the owner of a failed motor vehicle determines to the satisfaction of the Division that it cannot be repaired at reasonable cost, the owner may be granted a waiver provided the owner makes application to the Division prior to the registration expiration date or by such other time as may be specified by the Division.

e. The Division shall be responsible for specifying any forms or procedures to be followed in making applications pursuant to Section 6.1d.

Section 7 — Inspection Facility Requirements

7.1 Motor Vehicle Officers employed by the Division shall meet the requirements specified in this regulation.

7.2 Test equipment used by the Division shall be a type approved by the Department and testing procedures shall be conducted in accordance with the provisions of this regulation.

7.3 No person employed by the Division to test motor vehicle emissions shall engage in or have an interest in the operation of repair facilities located in this State; perform emission related repairs for compensation; or recommend repair facilities to owners or operators of vehicles being tested.

Section 8 — Certification of Motor Vehicle Officers

8.1 A person may not perform the duties of a motor vehicle officer for testing motor vehicle emissions or operating emission testing equipment to determine the compliance or noncompliance of a motor vehicle as required by this regulation at an official inspection station unless that person has applied for and has received certification in accordance with the provisions of this Section.

8.2 To become certified, a person shall successfully complete a training course for this purpose approved by the Department.

Section 9 — Calibration and Test Procedures and Approved Equipment

9.1 All emissions testing for the purpose of determining compliance with emissions standards shall be performed using equipment approved by the Department and calibration and test procedures as provided in this regulation.

9.2 Calibration and test procedures shall be those established by the Department in a Technical Memorandum #1 entitled "Motor Vehicle Inspection and Maintenance Program — Vehicle Test Procedure and Machine Calibration, dated 6/9/82.

REGULATION NO. 27
STACK HEIGHTS

Section 1 - General Provisions

1.1 The provisions of this regulation are to assure that the degree of emission limitation required for the control of any air pollutant is not affected by that portion of any stack height which exceeds good engineering practice (GEP) or by any dispersion technique.

1.2 This regulation does not restrict the physical heights of stacks but does restrict the credit for that portion of any stack height which may be used for dispersion techniques.

Section 2 - Definitions Specific to this Regulation

2.1 DISPERSION TECHNIQUE: (A)(1) Any technique which attempts to affect the concentration of a pollutant in the ambient air by:

(i) using that portion of a stack which exceeds good engineering practice stack height;

(ii) varying the rate of emission of a pollutant according to atmospheric conditions or ambient concentrations of that pollutant; or

(iii) increasing final exhaust gas plume rise by manipulating source process parameters, exhaust gas parameters, stack parameters, or combining exhaust gases from several existing stacks into one stack; or other selective handling of exhaust gas streams so as to increase the exhaust gas plume rise.

(2) The preceding sentence does not include:

(i) the reheating of a gas stream, following use of a pollution control system, for the purpose of returning the gas to the temperature at which it was originally discharged from the facility generating the gas stream;

(ii) the merging of exhaust gas streams where:

(a) the source owner or operator demonstrates that the facility was originally designed and constructed with such merged gas streams;

(b) after July 8, 1985, such merging is part of a change in operation at the facility that includes the installation of pollution controls and is accompanied by a net reduction in the allowable emissions of a pollutant. This exclusion from the definition of "dispersion techniques" shall apply only to the emission limitation for the pollutant affected by such change in operation; or

(c) before July 8, 1985, such merging was part of a change in operation at the facility that included the installation of emissions control equipment or was carried out for a sound economic or engineering reason. Where there was an increase in the emission limitation or, in the event that no emission limitation was in existence prior to the merging, an increase in the quantity of pollutants actually emitted prior to the merging, the reviewing agency shall presume that merging was significantly motivated by an intent to gain emissions credit for greater dispersion. Absent a demonstration by the source owner or operator that merging was not significantly motivated by such intent, the reviewing agency shall deny credit for the effects of such merging in calculating the allowable emissions for the source;

(iii) smoke management in agricultural or silvicultural prescribed burning programs;

(iv) episodic restrictions on residential woodburning and open burning; or

(v) techniques under Section 2.1(A)(1)-(iii) which increase final exhaust gas plume rise where the resulting allowable emissions of sulfur dioxide from the facility does not exceed 5,000 tons per year.

2.2 EXCESSIVE CONCENTRATIONS: is defined for the purpose of determining good engineering practice stack height under Section 3.2(c) and means:

(A) for sources seeking credit for stack height exceeding that established under Section 3.2(B), a maximum ground-level concentration due to emissions from a stack due in whole or part to downwash, wakes and eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects and which contributes to a total concentration due to emissions from all sources that is greater than an ambient air quality standard. For sources subject to the prevention of significant deterioration program (Regulation No. XXV, Section 3) an excessive concentration alternatively means a maximum ground-level concentration due to emissions from a stack due in whole or part to downwash, wakes or eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects and greater than a prevention of significant deterioration increment. The allowable emission rate to be used in making demonstrations under this part shall be prescribed by the new source performance standard that is applicable to the source category unless the owner or operator demonstrates that this emission rate is infeasible. Where such demonstrations are approved by the Secretary, an alternative emission rate shall be established in consultation with the source owner or operator;

(B) for sources seeking credit after October 11th, 1983, for increases in existing stack heights up to the heights established under Section 3.2(B), either

(i) a maximum ground-level concentration due in whole or part to downwash, wakes or eddy effects as provided in paragraph Section 2.2(A) of this section, except that the emission rate specified by the Delaware State implementation plan (or, in the absence of such a limit, the actual emission rate) shall be used, or

(ii) the actual presence of a local nuisance caused by the existing stack, as determined by the Secretary; and

(C) for sources seeking credit after January 12, 1979, for a stack height determined under Section 3.2(B) where the Secretary requires the use of a field study or fluid model to verify GEP stack height, for sources seeking stack height credit after November 9, 1984 based on the aerodynamic influence of cooling towers, and for sources seeking stack height credit after December 31, 1970 based on the aerodynamic influence of structures not adequately represented by the equations in Section 3.2(B), a maximum ground-level concentration due in whole or part to downwash, wakes or eddy effects that is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects.

2.3 NEARBY: (A) As used in Section 3.2B, that distance up to five times the lesser of the height or the width dimension of a structure but not greater than 0.8 km (one-half mile).

(B) For conducting demonstrations under Section 3.2(C) means not greater than 0.8 km (½ mile), except that the portion of a terrain feature may be considered to be nearby which falls within a distance of up to 10 times the maximum height (H_t) of the feature, not to exceed 2 miles if such feature achieves a height (H_t) 0.8 km from the stack that is at least 40 percent of the GEP stack height determined by the formulae provided in Section 3.2(B)(ii) of this part or 26 meters, whichever is greater, as measured from the ground-level elevation at the base of the stack. The height of the structure or terrain feature is measured from the ground-level elevation at the base of the stack.

2.4 STACK: Any point in a source designed to emit solids, liquids or gases into the air, including a pipe or duct but not including flares.

2.5 STACK IN EXISTENCE: means that the owner or operator had

(1) begun, or caused to begin, a continuous program of physical on-site construction of the stack or

(2) entered into binding agreements or contractual obligations, which could not be cancelled or modified without substantial loss to the owner or operator, to undertake a program of construction of the stack to be completed in a reasonable time.

Section 3 — Requirements for Existing and New Sources

3.1 For existing and new sources, the degree of limitation required of any source for control of any air contaminant shall not be affected by so much of any source's stack height that exceeds good engineering practice or by any other dispersion technique except as provided in Section 3.2C. The "Guideline for Determination of Good Engineering Practice Stack Height", EPA-450/4-80-023R July, 1985, provides guidance for determining good engineering practice stack heights.

3.2 Good Engineering Practice (GEP) stack height is the greater of:

(A) 65 meters, measured from the ground-level elevation at the base of the stack:

(B)(i) For stacks in existence on January 12, 1979, and for which the owner had obtained all applicable permits or approvals in accordance with these regulations, $Hg = 2.5 H$, provided the owner or operator produces evidence that this equation was actually relied on in establishing an emission limitation;

(ii) For all other stacks, $Hg = H + 1.5L$, where

Hg = good engineering practice stack height, measured from the ground level elevation at the base of the stack.

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension height or projected width of nearby structure(s).

provided that the Secretary may require the use of a field study or fluid model to verify GEP stack height for the source; or

(C) The height demonstrated by a fluid model or a field study approved by the Secretary, which ensures that the emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, structures or terrain features. "Guideline for Use of Fluid Modeling to Determine Good Engineering Practice Stack Height", July, 1981, EPA 450/4-81-003, and "Guideline for Fluid Modeling of Atmospheric Diffusion", April, 1981, EPA 600/8-81-009, shall provide guidance of fluid modeling demonstrations.

3.3 The provisions of Section 3.1 shall not apply to

(1) stack heights in existence or dispersion techniques implemented prior to December 31, 1970, except where pollutants are being emitted from such stacks or using such dispersion techniques by sources, as defined in Section 2. of Regulation No. 1, which were constructed, or reconstructed, or for which major modifications, as defined in Sections 1 and 3 of Regulation No. XXV, were carried out after December 31, 1970; or

(2) coal-fired steam electric generating units subject to the provisions of Section 118 of the Clean Air Act, which commenced operation before July 1, 1957, and whose stacks were constructed under a construction contract awarded before February 8, 1974.

Section 4 — Public Notification

4.1 A new or revised emission limitation that is based on a good engineering practice stack height that exceeds the height allowed by Section 3.2 A or B shall be given public notification citing the basis for preliminary approval and specifying that there is an opportunity for a public hearing for interested persons to appear and submit written or oral comments on the emission limitation or basis for preliminary approval proposed by the Department. The Department shall consider all written comments submitted on reaching a final determination.

DOCUMENTS NOT INCLUDED

[*Editor's note:* 40 CFR 51 is published in Environment Reporter — Federal Regulations — 2 at 125:0101. 40 CFR 60 is published in Federal Regulations — 1 at 120:0301.]

To reduce printing costs, the following Appendixes as adopted by the Department have been omitted from this copy of the regulations but are available from the Department upon request:

SOURCE MONITORING, RECORD KEEPING AND REPORTING — Regulation No. 17

MINIMUM EMISSIONS MONITORING REQUIREMENTS

Appendix P, 40 CFR Part 51, and Part 60.894(b), 40 CFR Part 60, dated July 1, 1984.

NEW SOURCE PERFORMANCE STANDARDS — Regulation No. 20

TEST METHODS

Appendix A, 40 CFR Part 60, dated July 1, 1984.

Appendix B, 40 CFR Part 60, dated July 1, 1984.

Appendix A, Method 3A, 6C, 7E, FR, Vol. 49, No. 248, December 24, 1984, pp. 49964-49971.

Appendix A, Method 5, FR, Vol. 50, No. 6, January 9, 1985, pp. 1164-1166.

EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS — Regulation No. 21

TEST METHODS

Appendix B, 40 CFR Part 60, dated July 1, 1984.

Appendix B, FR, Vol. 47, No. 173, September 7, 1984.

Appendix B, Method 105, FR, Vol. 49, No. 178, September 12, 1984, pp. 35768—35771.

CONTROL OF VOLATILE ORGANIC COMPOUNDS EMISSIONS — Regulation No. 24

TEST METHODS

Appendix A, Pressure-Vacuum Test Procedures for Lead Tightness of Truck Tanks

Appendix B, Gasoline Vapor Leak Detection Procedure by Combustible Gas Detection

Appendix C, Leak Detection Procedure for Bottom-Loaded Truck Tanks by Bag Capture Method

Appendix D, Emission Test Procedure for Tank Truck Gasoline Loading Terminals

MOTOR VEHICLE EMISSIONS INSPECTION PROGRAM — Regulation No. 26

Technical Memorandum #1 — "Motor Vehicle Inspection and Maintenance Program — Vehicle Test Procedure and Machine Calibration", dated 6/9/82

Technical Memorandum #2 — "Motor Vehicle Inspection and Maintenance Program — Emission Limit Determination", dated 6/9/82, revised 5/9/85.

STACK HEIGHTS — Regulation No. 27

Guideline for Determination of Good Engineering Practice Stack Height, EPA-450/4-80-023, July 1981

Guideline for Use of Fluid Modeling to Determine Good Engineering Practice Stack Height, EPA-450/4-81-003, July 1981

Guideline for Fluid Modeling of Atmospheric Diffusion, EPA-600/8-81-009, April 1981

DISTRICT OF
COLUMBIA

800.1 The requirements of 40 CFR 61.141, 61.145, 61.146, 61.147, 61.152, 61.154, and 61.156, as amended through April 5, 1984, are hereby adopted by reference, with the terms used and defined, except that:

(a) The definition of "asbestos" at 49 FR 13661, §61.141 is not adopted by reference;

(b) The word "Administrator" as used in the CFR sections shall be taken to mean "Mayor;"

(c) The requirements listed in §61.145 shall be thirty (30) feet instead of two hundred sixty (260) feet and eighteen (18) square feet instead of one hundred sixty (160) square feet;

(d) There shall be a rebuttable presumption that all asbestos is friable asbestos material as that term is defined above in the applicable CFR section adopted by reference;

(e) Planned renovation operations subject to §800 shall not be started prior to receipt of written approval therefor from the Mayor;

(f) Demolition operations subject to §800, except for those subject to 40 CFR §61.145(c), shall not be started prior to receipt of written approval therefor from the Mayor;

800.2 For the convenience of persons subject to the requirements of §800.1, Appendix No. 4 to this Subtitle contains 49 FR 13661-13665 (April 5, 1984) which includes the sections cited in 800.1.

801 SULFUR CONTENT OF FUEL OILS

801.1 The purchase, sale, offer for sale, storage, transport, or the use of, fuel oil which contains more than one percent (1%) sulfur by weight in the District is prohibited, if the fuel oil is to be burned in the District.

802 SULFUR CONTENT OF COAL

802.1 The purchase, sale, offer for sale, storage, transport, or use of coal which contains more than one percent (1%) sulfur by weight in the District shall be prohibited, if the coal is to be burned in the District. However, when the Mayor certifies in writing that the combustion-gas-desulfurization system used at a stationary source results in sulfur oxide emission no greater than the emissions normally resulting from the burning of coal with one percent (1%) sulfur content, coal of a higher sulfur content may be burned at the stationary source.

802.2 Application for a certification shall be made in writing to the Mayor by the owner or operator of the stationary source and, upon presentation to a seller of the certification, a copy of which shall be retained by the seller, the sale, purchase, and transportation of the coal shall be permitted.

803 SULFUR PROCESS EMISSIONS

803.1 The discharge into the atmosphere of sulfur oxides calculated as sulfur dioxide, in excess of five one hundredths percent (0.05%) by volume is prohibited.

803.2 Where the process or the design of equipment is such as to permit more than one interpretation of this section, the interpretation that results in the minimum value of allowable emissions shall apply.

803.3 Adding diluted air to the exhaust gas stream for the purpose of complying with the provisions of §§803.1 through 803.2 is prohibited.

804 NITROGEN OXIDE EMISSIONS

804.1 No person shall discharge, or cause the discharge into the atmosphere of nitrogen oxides from fossil fuel-fired steam generating units of more than one hundred million (100,000,000) British Thermal Units (B.T.U.) per hour heat input in excess of the emission limits set forth in Appendix No. 1.

899 DEFINITIONS AND ABBREVIATIONS

899.1 The meanings ascribed to the definitions appearing in §199.1 of chapter 1 of this title shall apply to the terms in this chapter.

899.2 The meanings ascribed to the abbreviations appearing in §199.2 of chapter 1 of this title shall apply to the abbreviations in this chapter.

Chapter 9 - Motor Vehicular Pollutants, Lead, Odors, and Nuisance Pollutants

900 ENGINE IDLING

900.1 The engine of a gasoline or diesel powered motor vehicle, including private passenger vehicles, on public or private space shall not idle for more than three (3) minutes while the motor vehicle is parked, stopped or standing, except as follows:

(a) To operate power takeoff equipment such as, but not limited to, dumping, cement mixers, refrigeration systems, content delivery, winches, or shredders;

(b) To operate for fifteen (15) minutes air conditioning equipment on buses with an occupancy of twelve (12) or more persons; and

(c) To operate heating equipment when the local temperature is thirty-two (32) degrees Fahrenheit or below.

901 VEHICULAR EXHAUST EMISSIONS

901.1 The engine, power and exhaust mechanism of each motor vehicle shall be equipped, adjusted and operated to prevent the escape of a trail of visible fumes or smoke for more than ten (10) consecutive seconds.

902 LEAD CONTENT OF GASOLINE

902.1 No gasoline containing more than one (1.0) gram of lead per gallon shall be sold.

903 ODOROUS OR OTHER NUISANCE AIR POLLUTANTS

903.1 An emission into the atmosphere of odorous or other air pollutants from any source in any quantity and of any characteristic, and duration which is, or is likely to be injurious to the public health or welfare, or which interferes with the reasonable enjoyment of life and property is prohibited.

903.2 The emission of an odor shall be deemed a violation of this section when after separate complaints of three (3) or more persons:

(a) The Mayor, using the Barneby-Cheney Scentometer at Number one (1) odor strength, detects an odor; or

(b) The Mayor, using any other device approved by him or her as an effective instrument in the detection of odors, records an odor.

999 DEFINITIONS AND ABBREVIATIONS

FLORIDA

FLORIDA CLEAN OUTDOOR AIR LAW

(Florida Statutes, Title XXII — Motor Vehicles, Chapter 325 — Vehicle Safety Equipment; Enacted by Laws of 1988, 88–129; Amended by Laws of 1989, Ch. 212)

325.201. Short title.

This act may be cited as the "Clean Outdoor Air Law."

325.202. Definitions.

As used in this act, the term:

(1) "Air pollution control equipment" means any equipment or feature installed by the manufacturer or replaced with a device or system equivalent in design and function to the part that was originally installed on the motor vehicle which constitutes an operational element of the air pollution control system or mechanism of a motor vehicle.

(2) "Contractor" means any person, corporation, or partnership with whom the department may enter into a contract for the purchase, lease, design, construction, equipment, maintenance, personnel, management, and operation of an inspection station.

(3) "Department" means the Department of Highway Safety and Motor Vehicles.

(4) "Federal act" means the federal Clean Air Act, as amended, and regulations issued by the United States Environmental Protection Agency under that act.

(5) "Inspection" means the determination of the level of exhaust emissions of a motor vehicle and of the existence of tampering.

(6) "Inspection certificate" means a serially numbered form issued by an inspection station or self-inspector indicating that the identified motor vehicle has been inspected and meets the requirements of this act.

(7) "Inspection station" means a facility, other than a self-inspection facility, situated in a permanent structure or a mobile unit, for the purpose of conducting emissions inspections of motor vehicles as required by this act.

(8) "Motor vehicle" means any self-propelled vehicle required to be registered under s. 320.02.

(9) "Nonattainment area" means an area which has been designated by the administrator of the United States Environmental Protection Agency (EPA), pursuant to the federal act, as exceeding national primary or secondary ambient air quality standards for the pollutants carbon monoxide or ozone.

(10) "Program area" means counties designated by the Department of Environmental Regulation as air-quality nonattainment areas in accordance with this act, and counties which voluntarily request inclusion pursuant to the provisions of s. 325.204.

(11) "Self-inspector" means any person or governmental entity that owns or leases at least 25 motor vehicles, including vehicles held for resale by a motor vehicle dealer licensed under chapter 320 and is licensed by the department to inspect such vehicles.

(12) "Tamper" means to dismantle, remove, or render ineffective any air pollution control equipment which has been installed on a motor vehicle by the vehicle manufacturer except to replace such device or system with a device or system equivalent in design and function to the part that was originally installed on the motor vehicle.

325.203. Motor vehicles subject to annual inspection; exemptions.

(1) Beginning January 1, 1991 or as soon thereafter as possible as determined by the department, each motor vehicle which is required to obtain an inspection certificate shall obtain one or a waiver annually within 90 days prior to the expiration of the motor vehicle registration period.

(2) Unless exempt pursuant to subsection (3) or subsection (4), each motor vehicle which is owned or leased by a person who resides in a county designated as part of the program area is subject to inspection. A person's county of residence is determined by the address provided on the registration certificate. A motor vehicle owner who intentionally provides an incorrect address at the time of registration with the intention of avoiding the inspection requirements of this chapter is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 and s. 775.083.

(3) The department may provide a temporary exemption, not to exceed 1 year, for any vehicle unavailable for inspection due to the motor vehicle's absence from the program area or because it is inoperative, or the owner's or lessee's absence from the program area or incapacity, during the 90-day period immediately prior to the registration expiration date. The owner or lessee of the motor vehicle may request a letter of temporary exemption on a form to be provided by the department. The owner or lessee shall identify the motor vehicle involved, provide the reason for requesting the letter of temporary exemption, certify that the vehicle will not be available for emissions inspection during the 90-day period immediately prior to the registration expiration date, and state the date upon which the motor vehicle will again be operated within the program area. Upon approval by the department, a letter of temporary exemption must be issued to the motor vehicle owner or lessee, and the motor vehicle registration may be renewed. As a condition of temporary exemption, the motor vehicle must be inspected within 30 days after the date upon which it becomes operational within

a program area.

(4) The following motor vehicles are not subject to inspection:

(a) Motor vehicles which have a net vehicle weight greater than 5,000 pounds or a gross vehicle weight greater than 10,000 pounds.

(b) Motor vehicles which are designated as model years 1974 or older.

(c) Golf carts, as defined in s. 320.01.

(d) Farm vehicles, as defined in s. 320.51.

(e) Motor vehicles on which are displayed a dealer license plate authorized in s. 320.13(1)(a).

(f) Motorcycles, as defined in s. 320.01.

(g) Mopeds, as defined in s. 320.01.

(h) Propane-powered vehicles.

(i) Natural-gas-powered vehicles.

(j) Any vehicle powered by other than gasoline or diesel fuel which is exempted by rule of the Department of Highway Safety and Motor Vehicles upon Department of Environmental Regulation determination that the vehicle does not significantly contribute to air pollution.

(k) New motor vehicles, as defined in s. 319.001(4). Such vehicles are exempt from the inspection requirements of this act at the time of the first registration by the original owner and, thereafter, are subject to the inspection requirements of this act.

(5) Unless exempt pursuant to subsection (3) or subsection (4), each motor vehicle owned or leased by the state which is subject to the provisions of part II of chapter 287 and which is primarily used in a program area is subject to inspection. Before February 1 of each year, each state agency which owns or leases motor vehicles that are subject to inspection shall submit to the department in the prescribed format a list of all motor vehicles that are subject to inspection and shall indicate pass/fail results of the inspection for each such vehicle.

(6) Each motor vehicle which is subject to inspection may not be registered pursuant to chapter 320 unless the motor vehicle has a valid inspection certificated or a waiver.

(7) The owner of each motor vehicle shall obtain an inspection certificate within 90 days before the expiration of the motor vehicle registration period. Upon the receipt of an inspection certificate or waiver and payment of the appropriate inspection fees, the vehicle owner may complete registration of the motor vehicle as prescribed in chapter 320.

(8) No motor vehicle dealer, motor vehicle broker as defined in s. 320.27, mobile home dealer as defined in s. 320.77, or person located in a program area, may sell at retail any motor vehicle which is subject to inspection under this act and which is to be registered in a program area unless the motor vehicle has received a valid inspection certificate within 90 days prior to its sale. If a motor vehicle is purchased outside the program area and is required to be registered in the program area, the purchaser must meet the inspection requirements of the act prior to such registration.

325.204. Program area designation by county.

By a majority vote of its governing body, each county not in the program area may become part of the program area by requesting the department to provide for the inspection program in such county. Each county which becomes part of the program area pursuant to this section shall remain part of the program area for at least 5 years. If requested by the governing board of any county considering inclusion in the program area, the department shall provide such county information describing a proposed program structure and operation for such county. Inspection programs in counties which are included in the program area pursuant to this section shall be implemented in accordance with all provisions of this act.

325.205. Safety inspections; reporting requirements; rules.

(1) In each program area the department shall require the contractor to make available to the driving public a supplemental safety inspection for each motor vehicle subject to the inspection provisions of this act. The safety inspection shall be voluntary and refusal by a driver to participate in the safety inspection portion of the program shall not be construed to be a violation of any provision of this act.

(2) Motor vehicles not subject to the emissions inspection provisions of this act, having a gross vehicle weight of 10,000 pounds or less, may be inspected at inspection stations on a volunteer basis, upon payment of the fee provided in s. 325.214.

(3) The department shall, by rule, develop uniform safety standards applicable to:

(a) Brakes;

(b) Tires;

(c) Undercarriage, steering linkage and suspension; and

(d) Any other item the department deems necessary to be inspected.

(4) Each vehicle presented for safety inspection shall receive a written report of the defects found, if any, and a written description of repairs likely to bring the vehicle into compliance with safety standards adopted by the department. All safety inspection reports shall be considered advisory in nature and subject to the provisions of s. 325.215.

(5) In addition to the reporting requirements set forth in s. 325.217, the contractor shall collect and maintain data, as it relates specifically to safety inspections, and shall report the data to the department as the department requires. The Department shall annually report to the Legislature, the first such report to be delivered prior to the 1991 regular session, on its analyses and evaluations of the data collected.

325.206. Exhaust emissions inspection criteria; rules.

(1) The Department of Environmental Regulation shall adopt rules to establish, periodically evaluate, and revise the uniform standards and criteria for the inspection of exhaust emissions, including maximum allowable emissions levels and emission opacity standards to be used in motor vehicle inspection stations. Such standards and criteria shall include, but are not limited to, exhaust emissions testing and inspection procedures and the development of inspection pass or fail criteria. Standards may vary by size, class, type, and year of each motor vehicle engine and may not be more stringent than those required by federal law at the time of the manufacture of the motor vehicle. In establishing standards and criteria, the Department of Environmental Regulation shall give consideration to levels of emissions reduction that are necessary to achieve applicable federal and state air quality standards.

(2) The Department of Environmental Regulation shall adopt rules establishing the test procedures and test equipment to be used for the emissions inspection. Test procedures shall be capable of being conducted by the motor vehicle repair industry for purposes of pass or fail criteria of the emissions inspection. Test equipment used in the emissions inspection or compa-

rable equipment shall be available to the motor vehicle repair industry in the open market.

(3) The Department of Highway Safety and Motor Vehicles shall enforce and administer the rules, standards, and criteria provided for in this section.

325.207. Inspection stations; department contracts; inspection requirements; recordkeeping.

(1) The department shall direct the implementation, operation, and regulation of emissions inspections required under this act. The department shall establish the requirements for inspection stations, enter into negotiated multiyear contracts with one or more private contractors for the operation of inspection stations, with a state option for renewal, and supervise the performance of such contractors.

(2) The Governor and Cabinet as head of the department shall approve any request for proposals by the department before the request for proposals is made available for bidding purposes. In addition, the Governor and Cabinet must approve the award of any contract to any contractor.

(3) The department shall incorporate as a provision of each contract, standards relating to maximum driving time to inspection stations and maximum waiting time at inspection stations and shall have the authority to impose penalties for failure of the contractor to meet such standards.

(4) Such contracts are subject to competitive procurement requirements and shall provide for the design, construction, equipment, maintenance, and operation of inspection stations in such numbers and locations as required to provide motor vehicle owners with reasonably convenient access to inspection facilities for the purpose of compliance with this act.

(5) To void conflicts of interest and ensure impartial inspections, the department may not enter into a contract to conduct emissions inspections with any contractor who:

(a) Engages in the business of manufacturing or selling motor vehicles in this state;

(b) Offers to the general public, for profit, motor vehicle maintenance or repair services in this state, except that a contractor may maintain or repair motor vehicles owned or leased by the contractor; or

(c) Lacks the capability, resources, or technical and management skills to adequately construct, equip, operate, and maintain a sufficient number of official emissions inspection stations to meet the demand for the inspection of every motor vehicle which is required to be inspected under the terms of the contract.

(6) By its selection process for contractors, the department shall seek to obtain the highest quality service for the lowest cost. Accordingly, the department shall give balanced consideration during its selection process to the following:

(a) The public convenience of the inspection stations, including a calculation of lowest average driving time to an inspection facility applicable to 90 percent of motor vehicles within each contract zone;

(b) The inspection fee bid proposed by a contractor;

(c) The degree of technological content of the proposal, including test-accuracy specifications, and quality of testing services;

(d) The experience of the contractor and the probability of successful performance of the contract;

(e) The financial stability of the contractor;

(f) The economic impact of the contract to the state during construction and operation of the inspection stations.

(7) All persons employed by a contractor are deemed to be employees of the contractor and not of the state. An officer, director, or employee of a contractor may not be an employee of the state.

(8) Any contract authorized under this section shall contain:

(a) A contract term of not less than 5 years of actual test operations.

(b) A clause stating that nothing in the contract requires the state to purchase any asset or assume any liability if such contract if not renewed.

(c) Minimum requirement for adequate staff, equipment, management, and operating hours which may include evening or weekend hours, or both.

(d) Provisions for surveillance by the department of the contractor to ensure compliance with emissions test standards and applicable procedures, rules, regulations, and laws.

(e) Provision for the state, upon default of the contractor, to terminate the contract with the contractor and assume operation of the motor vehicle emissions inspection station.

(f) Provision for the state, upon termination of the term of the contract or upon assumption of the operation of the program pursuant to paragraph (e), to have transferred or assigned to it, for reasonable compensation, any interest in land, buildings, improvements, services, and equipment used by the contractor in the operation of an inspection station.

(g) Provision for the state, upon termination of the term of the contract or upon assumption of the operation of the program, to have transferred and assigned to it, for reasonable compensation, any contract rights and related obligations for land, buildings, improvements, and equipment used by the contractor in the operation of the inspection station.

(h) A requirement that the contractor, in any agreement executed by him for land, buildings, improvements, and equipment used in the operation of the inspection stations, reserve the right to assign to the state any of his rights and obligations under such contract.

(i) A procedure for determining the damages payable by the state to the contractor if the Legislature abolishes the inspection program at any time prior to the conclusion of the contract term. This procedure must specify that the contractor and the department have 120 days from the effective date of the termination of the program to negotiate an amount to be paid to the contractor as reasonable compensation for its loss resulting from the termination of the contract due to the termination of the program. If the contractor and the department are not able to agree to an amount by the end of the 120-day period, the department shall determine the amount of reasonable compensation and notify the contractor in writing of its determination within 14 days of the end of the negotiation period and shall offer the contractor a point of entry to a s. 120.57 proceeding pursuant to the department's rules of procedure. This provision must specify that payment of such compensation to the contractor is subject to appropriation of funds for this purpose by the Legislature and that the department agrees in good faith to request the Legislature to appropriate the funds to pay such reasonable compensation. The damages recoverable by the contractor if the Legislature abolishes the program shall be limited to the funds appropriated by the Legislature pursuant to this section.

(j) Any other provision, including periodic audits of inspection fees collected, deemed necessary by the department for the administration or enforcement of the emissions inspection contract.

(k) A provision requiring that no less than 15 percent of all amounts expended by a contractor for the construction of inspection stations shall be expended on minority business enterprises as defined in s. 288.703. Additionally, no less than 15 percent of all amounts expended annually by a contractor for document printing costs and costs associated with the maintenance, repair, reconstruction, renovation and expansion of inspection stations shall be expended on such minority business enterprises. Each contractor shall submit to the department no later than March 1 of each year an affidavit certifying compliance with the provisions of this paragraph.

(l) A provision requiring a performance bond of $1 million.

(m) A provision requiring that the contractor determine, for each county in the program area, the availability of county facilities formerly used for the inspection of motor vehicles and that the contractor explore with appropriate county officials the feasibility of the contractor's acquisition or lease of such facilities, if any, for use as inspection stations.

(9) Inspection stations shall collect, maintain, and report data as the department requires. The department may enter and inspect the premises and equipment and audit the records of inspection fees collected at each inspection station at all reasonable times.

(10) The department shall maintain records of each inspection station and investigate bona fide complaints regarding inspection stations.

(11) Before accepting proposals, the department shall divide the state into three or more contract zones. The department shall contract with a private contractor for the exclusive right to conduct vehicle inspections in each zone. However, any contractor may bid on more than one zone, and the department may contract with a contractor to conduct vehicle inspections in more than one contract zone.

(12)(a) Information received in a sealed bid or proposal that would indicate the locating of inspection sites, or property sought to be acquired for such sites, is exempt from the provisions of s. 119.07(1), as follows:

1. For an unsuccessful bidder, from the time the bid or proposal is received, until 30 days after notice of intent to award a bid or proposal.

2. For successful bidders, from the time the bid or proposal is received, until completion of purchases or leases of real property required to carry out the contract provisions.

(b) The exemptions provided in this subsection from s. 119.07(1) are subject to the Open Government Sunset Review Act in accordance with s. 119.14.

(13)(a) The department and the Department of Environmental Regulation shall have reasonable access to all records of the contractor pertaining to the contract or duties imposed or undertaken pursuant to this chapter. Except as to information provided for in subsection (12), upon request of the contractor, any records received by the department or the Department of Environmental Regulation which are shown to be proprietary confidential business information shall be kept confidential and shall be exempt from s. 119.07(1).

(b) Proprietary confidential business information includes, and is limited to:

1. Trade secrets as defined in s. 812.081.

2. Security measures, systems, or procedures.

(c) Proprietary confidential business information does not include information received by the department or the Department of Environmental Regulation in carrying out the duties of the department under subsection (6), except such information which, if disclosed, would reveal:

1. Specifications pertaining to process or design;

2. The identity of or information about a person or entity not engaged or proposed to be engaged in providing services in connection with the proposal or contract, and not a party to, nor the subject of, the proposal or contract;

3. Specific financial assets of the contractor, or contracts of the contractor other than the contract provided for in this section.

(d) In any administrative proceeding brought under this chapter, upon a showing by the contractor and a finding by the hearing officer that such protection is necessary, the hearing officer shall issue protective orders protecting the contractor from discovery of proprietary confidential business information. If the hearing officer determines that discovery of proprietary confidential business information is necessary to preserve justice or to protect the public interest, however, the hearing officer shall enter an order limiting such discovery in the manner provided for in Rule 1.280 of the Florida Rules of Civil Procedure.

(e) The exemptions provided in this subsection from s. 119.07(1) are subject to the Open Government Sunset Review Act in accordance with s. 119.14.

325.208. Protests of contract awards and requests for proposals.

(1) The provisions of s. 120.53(5) shall control all protests of requests for proposals and contract awards, except that any person who wishes to file an action protesting the specifications or requirements of the request for proposals may do so within 10 days after publication of the request for proposals and may not file any other protest with respects to requests for proposals, and any subsequent protest action shall be filed in response to the contract award only and in accordance with the provisions of chapter 120.

(2) Any person who files an action protesting a contract awarded under this act shall post with the department, at the time of filing the formal written protest, a bond payable to the department in the amount of $500,000. The bond shall be conditioned upon the payment of all costs which may be adjudged against him in the administrative hearing in which the action is brought and any subsequent appellate court proceeding. If, after completion of the administrative hearing and any subsequent appellate court proceedings, the department prevails, it shall recover all costs and charges included in the final order of judgment. Such costs and charges include the cost to the state of any delays caused by the award protest and are not limited to the amount of the bond. Upon payment of such costs and charges by the person protesting the award, the bond shall be returned to that person. If the person protesting the contract award prevails, that person may recover from the department all costs and charges incurred, excluding attorney's fees.

325.209 Waivers.

(1) If the cost of repairs or adjustments necessary to bring a motor vehicle into compliance with the emissions standards

established under this act exceeds the required minimum amount specified in paragraph (2)(c), the department may issue a waiver, valid for no longer than 1 year, which exempts such motor vehicle from the inspection requirements of this act.

(2) Before a waiver may be issued, the following criteria must be met:

(a) The motor vehicle owner must present evidence satisfactory to the department that a low emissions adjustment, as defined by rule of the Department of Environmental Regulation, has been performed;

(b) The motor vehicle must not have been tampered with by either the current owner or any previous owner;

(c) The owner must have spent the required minimum amount for emissions-related repairs on the vehicle within the 90-day period prescribed in s. 325.203(1), not including the amount spent to repair or replace air pollution control equipment that has been tampered with. The required minimum amount that must have been spent on related repairs is:

1. For motor vehicles designated as model years 1975 through 1979: $100; and

2. For motor vehicles designated as model year 1980 and thereafter: $200;

(d) Repairs and adjustments provided for in paragraphs (2)(a) and (2)(c) must have caused substantial improvement in the emissions performance of the motor vehicle; and

(e) The motor vehicle must not be covered under any manufacturer's or federally mandated emissions warranty.

(3) A motor vehicle owner may repair or adjust his own motor vehicle. However, the department shall consider whether such repairs or adjustments have significantly improved the emissions performance of the vehicle in determining eligibility for a waiver.

(4) The department may, by rule, establish standards for and grant 1-year hardship exemptions to motor vehicle owners who fail to satisfy the standards for waivers, if there is a clear indication that the cost of required repairs would place a substantial financial burden on the owner of the motor vehicle. Such an exemption may not be granted to a motor vehicle owner who has himself tampered with the motor vehicle. A motor vehicle that has been tampered with and has had only one registered owner is prima facie evidence that the currently registered owner tampered with the motor vehicle.

(5) The department may deny any request for a waiver which does not meet the requirements of this section. Such denial must be in writing and must be made within 30 days after the department receives the request for a waiver. A motor vehicle owner may appeal, pursuant to chapter 120, any request for a waiver that has been denied.

325.211. Defective vehicles; repair procedures; reinspection requirement.

(1) When a motor vehicle fails to pass an inspection, the inspection station shall issue an inspection report which details the reasons for rejection and, when known, a written description of repairs or adjustments likely to bring the motor vehicle into compliance.

(2) Repairs or adjustments necessary to bring a motor vehicle into compliance are the responsibility of the motor vehicle owner. All such repairs and adjustments shall be made to the motor vehicle within 30 days of the date of original inspection.

(3) When a motor vehicle repair shop performs the repairs or adjustments of a motor vehicle necessary to correct the defect listed in the inspection report, such repair shop shall furnish to the motor vehicle owner a statement on the inspection report identifying the completed repairs or adjustments and the charges that were assessed. Failure of the motor vehicle repair shop to perform the repairs or adjustments for which charges were assessed is a deceptive and unfair trade practice under part II of chapter 501.

(4) Any inspection station may reinspect a motor vehicle which fails to pass an inspection.

325.212. Reinspections; reinspection facilities; rules; minority business participation.

(1) All inspection stations shall be authorized to reinspect any motor vehicle which fails to pass an inspection required by this act. However, no fee shall be charged for such reinspection.

(2) Any motor vehicle repair shop, as defined in s. 559.903(2), may apply to the department, on a form approved by the department, to be certified as a reinspection facility to reinspect motor vehicles which fail to pass inspections required by this act.

(3) Reinspection facilities certified pursuant to this section may reinspect motor vehicles which fail to pass inspections required by this act. Upon reinspection of a motor vehicle and a determination that such motor vehicles passes the inspection required by this act, the reinspection facility shall certify such passage on a reinspection certificate and shall furnish such certificate to the motor vehicle owner. The reinspection certificate shall be in the same form and content as the original inspection certificate.

(4) The Department of Environmental Regulation shall adopt, by rule, standards for certification of equipment used for reinspections, shall obtain and approve the most advanced technology available on the open market, and shall periodically update and evaluate currently certified equipment.

(5) To ensure uniform and consistent repairs and reinspections by qualified mechanics, reinspection facilities shall only utilize equipment which has been certified by the Department of Environmental Regulation.

(6) The department shall compile and maintain records using the sampling methodology necessary to ensure the scientific validity and reliability of all repairs and reinspections performed by reinspection facilities certified pursuant to this section, shall establish requirements for reinspection facilities certified to conduct reinspections, and shall monitor their performance.

(7) Record and data collection systems for the reinspection facilities must provide the same capability of being directly integrated into the original or first inspection data collection system. To assure a minimum of expense to the department and a minimum level of monitoring of the reinspection facilities, the department may contract for the data collection, exhaust analyzers, and supervisory assistance necessary to integrate the reinspection data management network into the original inspection data management network. It is the intent of the Legislature that reinspection facilities be supervised, monitored, and audited in the most efficient and effective manner possible.

(8) The licensure procedures for reinspection facilities, including application fees and any other prescribed fees, shall be at least equal to the licensure procedures established for self-inspectors in this act, except that the surety bond required shall be $25,000 for motor vehicle repair shops licensed as reinspection facilities.

(9) Reinspection facilities certified by the department are expressly prohibited from issuing waivers and from assessing a reinspection fee.

(10) To the extent possible, no less than 10 percent of the reinspection facilities certified by the department shall be owned and controlled by small business concerns defined as minority business enterprises in s. 288.703(2).

325.213. Self-inspectors.

(1) Any person who owns or leases 25 or more motor vehicles that are subject to inspection under this act, including motor vehicles held for resale by a motor vehicle dealer licensed under chapter 320, may apply to the department for a license as a self-inspector. The department shall prescribe by rule the form and content of the application. The application for licensure under this section shall be verified by oath or affirmation and shall contain:

(a) The name and birth date of the applicant, the name of the firm or partnership, with the names and places of residence of all members thereof, if such applicant is a firm or partnership; the names and places of residence of the principal officers, if the applicant is a body corporate or other artificial body; the name of the state under whose laws the corporation is organized; the present and former places of residence of the applicant; and any prior businesses in which the applicant has engaged and the location thereof;

(b) Certification that the applicant's business location provides an adequate location for the repair, maintenance, and inspection of the applicant's fleet of vehicles, that the location is not a residence, and that the location is a suitable place where the applicant can in good faith carry on such business and keep and maintain books, records, and files necessary to conduct such business. All such files and records relating to motor vehicles inspected by the self-inspector shall be available at all reasonable hours to inspection by the department or any of its inspectors or other employees;

(c) Certification that the applicant has obtained the machinery, tools, and equipment, approved by the Department of Environmental Regulation, to adequately conduct the required emissions inspections;

(d) Certification that the applicant employs properly trained personnel to perform the necessary emissions inspections. Criteria for such training of inspection personnel shall be developed by the Department of Environmental Regulation; and

(e) Other relevant information as may be required by the department.

(2) Any applicant shall pay to the department a fee of $100 in addition to any other fees required by law. Upon making a renewal application, the applicant shall pay to the department a fee of $50 in addition to any other fees required by law. If the applicant is a motor vehicle or mobile home dealer licensed under s. 320.27 or s. 320.77, the application fee and subsequent renewal application fee is $25, in addition to any other fees required by law.

(3) The department shall, in the case of every application for licensure as a self-inspector, verify certain facts set forth in the application. The department shall verify those items in the application relating to the applicant's past criminal record by way of, but not limited to, the complete records available through the state and national crime information centers and the applicant's financial references. The department may not issue a license to the applicant until it is satisfied that the facts set forth in the application are true.

(4) Each self-inspector license issued by the department is valid for the year of issue, and shall expire annually on December 31, unless revoked or suspended prior to that date. The self-inspector license for a motor vehicle and mobile home dealer shall expire annually on the same date that the dealer license issued pursuant to the provisions of s. 320.27 or s. 320.77 expires. A renewal application made subsequent to the expiration date must be accompanied by a delinquency fee of $50 in addition to the renewal application fee prescribed in subsection (2).

(5) The department may deny, suspend, or revoke any self-inspector license issued under this section for any violation of this section or for:

(a) Commission of fraud or willful misrepresentation in application for or in obtaining a self-inspector license.

(b) Conviction of a felony.

(c) Improper testing of motor vehicles owned or leased by the self-inspector.

(d) Inspection of any motor vehicle, for which the self-inspector is not the registered owner or lessee, unless otherwise previously authorized by the department.

(e) Improper use or misrepresentation of certificates of inspection issued by the department.

(6)(a) Prior to the issuance of a self-inspector license, the applicant shall deliver to the department a good and sufficient surety bond or irrevocable letter of credit, executed by the applicant as principal, in the sum of $5,000. If the applicant is a motor vehicle or mobile home dealer licensed by the department, this requirement shall be waived in lieu of the surety bond required under s. 320.27 or s. 320.77.

(b) Surety bonds and irrevocable letters of credit shall be in a form approved by the department. Such bonds and letters of credit shall be assigned to the department and in favor of any person who suffers any loss as a result of any violation of this section.

(c) Surety bonds shall be executed by a surety company authorized to do business in the state as surety, and irrevocable letters of credit shall be issued by a bank authorized to do business in the state. Irrevocable letters of credit must be engaged by a bank as an agreement to honor demands for payment as specified in this section or by the department.

(d) The department shall, upon denial, suspension, or revocation of any self-inspector license, notify the surety company of the licensee, or bank issuing an irrevocable letter of credit for the licensee, in writing, that the license has been denied, suspended, or revoked and shall state the reason for such denial, suspension, or revocation.

(e) Any surety company which cancels the bond of any self-inspector licensee or any bank which cancels an irrevocable letter of credit shall notify the department in writing of such cancellation giving the reason for the cancellation.

(7) Any self-inspector shall, upon filing an application in the manner and form prescribed by this section with the department and paying the prescribed application fee, receive a sufficient number of certificates of inspection for each motor vehicle in the applicant's fleet. The department shall prescribe a fee for each inspection certificate not to exceed 50 cents. A certificate of inspection may not be issued to any fleet vehicle until it has been inspected and passes inspection in compliance with this act.

(8) The holder of a self-inspector license

may not inspect any motor vehicle or provide a certificate of inspection to any motor vehicle for which the licensee is not the registered owner or lessee, unless otherwise authorized by the department.

(9) In addition to the exercise of other powers provided in this section, the department may levy and collect a civil fine, not to exceed $1,000 for each violation, against any self-inspector licensee if it finds that the licensee has violated any provision of this section or any other law of this state related to motor vehicle emissions inspections. The license shall be entitled to a hearing pursuant to chapter 120, to contest the fine levied, or about to be levied, upon him.

325.214. Motor Vehicle Inspection Trust Fund; creation; fees; disposition of fees.

(1) All moneys received by the department pursuant to this act, less the deduction required by s. 215.20, shall be deposited into the Motor Vehicle Inspection Trust Fund, which is hereby created.

(2) The department shall set an inspection fee, not to exceed $10. By rule, the department shall set a regulatory amount to be included in the fee which is commensurate with the cost of administering and enforcing the inspection program. It is the intent of the Legislature that the program be self-supporting.

(3) Each inspection station shall collect an inspection fee for every inspection; provided, however, the owner of a motor vehicle which fails inspection shall be entitled to one reinspection without charge.

(4) Motor vehicles inspected after the expiration of the motor vehicle registration date shall be subject to an additional delinquency charge of $2, which shall be collected by the inspection station.

(5) By the 15th of each month, each inspection station shall remit to the department the regulatory amount of every inspection fee and the delinquency charges collected for the preceding month.

325.215. Inspection not a warranty of mechanical condition.

The inspection of a motor vehicle and the issuance of an inspection certificate does not constitute a warranty of the mechanical condition of the motor vehicle. An inspector or inspection station which inspects a motor vehicle and issues an inspection certificate shall not be held liable for damages for any defect, failure, or improper functioning of any item of equipment on such motor vehicle.

325.216. Violations; penalties.

It is unlawful for any person to forge or alter an inspection certificate or to reproduce an inspection certificate unless authorized by the department. It is unlawful for any person to knowingly possess an unauthorized inspection certificate. Any person who violates this section is guilty of a felony of the third degree, punishable as provided in s. 775.082, s. 775.083, or s. 775.084.

325.217. Cost-benefit analyses and other evaluations; reports to Legislature.

(1) The department shall, in conjunction with the Department of Environmental Regulation, conduct ongoing cost-benefit analyses and other evaluations of the emissions inspection program, including quantifications of reductions in air pollution and recommendations to the Legislature for improving the emissions inspection program. Such recommendations shall also address the feasibility of offering motor vehicle owners the option of completing motor vehicle registration at the inspection stations using employees of the county tax collector or the department, notifying motor vehicle owners of recalls affecting their motor vehicle, assisting in the identification of stolen motor vehicles, and verifying insurance coverage, compliance with financial responsibility requirements, and odometer readings for purposes of motor vehicle registration.

(2) The department shall deliver annual written reports to the Legislature on such analyses and evaluations, the first such report to be prior to the 1991 regular session of the Legislature.

325.218. Public education.

(1) The department, with the cooperation of the Department of Environmental Regulation, shall implement a continuing public education program to begin 12 months before the commencement of the emissions inspection program. The department may contract for the implementation of such public education program. However, the department shall approve all public education activities and expenditures prior to implementation of such program by the contractor.

(2) The driver handbook prepared and distributed by the department shall be modified to also include information regarding the emissions inspection program. The handbook shall explain the inspection program, the motor vehicle owner's responsibilities under the program, and common adjustments and repairs likely to be required for a motor vehicle to pass the emissions inspection.

325.219. Rules.

The Department of Highway Safety and Motor Vehicles shall adopt any rules necessary to implement the motor vehicle emissions inspection program.

GEORGIA

GEORGIA VEHICLE EMISSIONS CONTROL ACTS

(Code of Georgia, Title 40 — Motor Vehicles and Traffic, Chapter 8 — Equipment and Inspection of Vehicles, Article 2 — Control of Vehicle Emissions; Enacted by Georgia Laws of 1971, page 186; Amended by Laws of 1972, p. 989; Laws of 1979, p. 1213; Laws of 1981, p. 1441; Laws of 1982, p. 165; Laws of 1983, p. 3; Laws of 1985, p. 149, p. 1092; Laws of 1986, p. 10, p. 1061; Laws of 1987, p. 626; Laws of 1989, p. 1404)

Administering Agency: **Georgia Highway Patrol
State Department of Public Safety
959 East Confederate Avenue, S.E.
Atlanta, Georgia 30303**

Part 1
Emission Control Devices Generally

40-8-130. Unlawful to operate vehicle without serviceable emission control device; penalty; exceptions.

(a) It shall be unlawful for the owner of any motor vehicle to operate or permit the operation of such vehicle on which any device controlling or abating atmospheric emissions which is placed on a motor vehicle by the manufacturer pursuant to regulations promulgated by the United States Secretary of Health and Human Services in accordance with the provisions of Title II, the National Emissions Standards Act, of the Air Quality Act of 1967, Public Law 90-148 has been rendered unserviceable by removal, alteration, or other interference with its operation.

(b) Any person violating subsection (a) of this Code section shall be guilty of a misdemeanor.

(c) Subsection (a) of this Code section shall not apply to any person repairing any such device described in that subsection or to the removal of any such device by any person for the purpose of repairing or replacing such device.

(d) Subsection (a) of this Code section shall not apply to any person removing any such device for the purpose of converting any motor vehicle to operate on natural or liquefied petroleum gas or make any other modifications which would reduce atmospheric emissions.

40-8-131. Inspection without warrant authorized.

Any vehicle suspected of being operated in violation of this part may be the subject of an inspection conducted by an officer of the Georgia State Patrol who has reason to believe such violation is occurring, without the necessity of obtaining a warrant to permit such inspection.

40-8-132. [Repealed]

Part 2
Establishment of Emission Standards; Inspection of Motor Vehicles for Compliance with Standards

40-8-150. Short title.

This part shall be known and may be cited as the "Georgia Motor Vehicle Emission Inspection and Maintenance Act."

40-8-151. Legislative findings.

With respect to the ambient air quality in this state, the General Assembly finds that:

(1) Some counties of the state have ambient air levels of photochemical oxidants (ozone) or carbon monoxide in excess of the National Ambient Air Quality Standards (NAAQS) for such pollutants specified by the United States Environmental Protection Agency (USEPA) pursuant to the Federal Clean Air Act (42 U.S.C. Section 1857, et seq., as amended, and 42 U.S.C. Section 7401, et seq., as amended); and that in all such cases, such excess levels in such counties are directly related to emissions of hydrocarbons and carbon monoxide from responsible motor vehicles registered or licensed (as below) in counties wherein more than 200,000 motor vehicles are registered or licensed pursuant to or subject to the requirements of Chapter 2 of this title;

(2) In order to comply with federal health related air standards, it is necessary to monitor and limit emissions of hydrocarbons and carbon monoxide from responsible motor vehicles registered or licensed in counties wherein more than 200,000 motor vehicles are so registered;

(3) The USEPA has the duty, by law, to designate those areas of the state violating the NAAQS and has and will, from time to time, as facts dictate, designate those areas then violating the NAAQS for photochemical oxidants (ozone) and carbon monoxide;

(4) With respect to such designations, when areas are designated to have ambi-

ent air levels of pollutants in excess of the NAAQS, the state is under a duty to provide a plan for reducing the ambient air levels of pollutants found to be in excess if the state is to maintain its authority to permit new or expanded industry in such areas; and

(5) Failure of the state to provide a legally enforceable mechanism pursuant to state law for reducing such pollutants in such areas to levels within the NAAQS will result in such a mechanism subsequently being devised by USEPA and enforced in such areas pursuant to federal law, and could result in a significant loss of federal funds for sewage treatment plants, transportation projects, and air quality improvement funds; further, no new or expanded industry which would contribute to the ambient air level of such pollutants could be permitted to construct or operate in any such area.

40-8-152. Declaration of policy.

It is declared to be the public policy of the State of Georgia as expressed in this part to preserve, protect, and improve air quality in those counties of the state where the ambient air levels of photochemical oxidants (ozone) or carbon monoxide are in excess of the NAAQS, as designated by USEPA; and to that end to provide a legally enforceable mechanism for the attainment and maintenance of the NAAQS of such pollutants in such counties by requiring that emissions of hydrocarbons and carbon monoxide from responsible motor vehicles registered or licensed in counties wherein more than 200,000 motor vehicles are registered or licensed comply with emission standards or limitations established under this part and that such responsible motor vehicles shall be subject to inspection of emissions and inspection and maintenance of emission control equipment to ensure compliance with such emission standards.

40-8-153. Definitions.

As used in this part, the term:

(1) "Board" means Board of Natural Resources.

(2) "Certificate of authorization" means a permit issued by the Department of Public Safety to each establishment designated as an official emission inspection station.

(3) "Certificate of emission inspection" means an official certificate that emissions and emission control equipment have been inspected and approved. Such certificates will be furnished to official emission inspection stations by the Department of Public Safety to be completed and issued by such stations to the owner or operator of a responsible motor vehicle upon inspection and approval of that vehicle following completion of any inspection or inspection and maintenance required by this part.

(4) "Commissioner" means the commissioner of public safety.

(5) "Department" means the Department of Public Safety.

(6) "Director" means the director of the Environmental Protection Division of the Department of Natural Resources.

(7) "Emissions inspection station" means a motor vehicle dealership, garage, service station, or other establishment designated by the Department of Public Safety as an official responsible motor vehicle emission inspection station to carry out the emission inspections required by this part.

(8) "Exhaust emission" means:

(A) The act of releasing hydrocarbons or carbon monoxide into the ambient air by means of a motor vehicle exhaust system; or

(B) The material so passed into the ambient air.

(9) " Evaporative emission" means:

(A) The act of releasing hydrocarbons into the ambient air by means of evaporation from a motor vehicle; or

(B) The material so passed into the ambient air.

(10) "Federal Clean Air Act" means 42 U.S.C. Section 1857, et. seq., as amended, and 42 U.S.C. Section 7401, et. seq., as amended.

(11) "Gross weight" means the manufacturer's gross weight rating for the individual vehicle.

(12) "Highway" means any road or way publicly maintained and open for use by the public for vehicular traffic.

(13) "Hydrocarbons" means any compound containing carbon and hydrogen.

(14) "Mechanic inspector" means a natural person approved and issued a permit by the Department of Public Safety to perform the emission inspections required by this part.

(15) "Model year" means the manufacturer's annual production period, as determined by the director of the Environmental Protection Division of the Department of Natural Resources, provided that, if the manufacturer has no annual production period, the term "model year" shall mean the calendar year. The model year shall be determined by the vehicle identification number appearing on the vehicle.

(16) "Motor vehicle" means any contrivance propelled by power other than muscular power, used for transportation of persons or property on highways, and not operated exclusively upon tracks.

(17) "NAAQS" means the National Ambient Air Quality Standards for air pollutants prescribed by USEPA pursuant to the Federal Clean Air Act.

(18) "National Ambient Air Quality Standards" means those allowable ambient air concentrations for pollutants, including photochemical oxidants (ozone) and carbon monoxide, specified by USEPA pursuant to 42 U.S.C. Section 1857, et. seq., as amended, and 42 U.S.C. Section 7401, et. seq., as amended.

(19) "Owner" means the registered owner or the individual presenting the responsible motor vehicle for the emission inspection required under this part.

(20) "Person" means any natural person or individual, corporation, partnership, association, state or federal government, political subdivision, agency, or instrumentality of the state or federal government or any other entity.

(21) "Photochemical oxidant" means ozone.

(22) 'Responsible motor vehicle' means any motor vehicle propelled by gasoline combustion power, except motorcycles and motor driven cycles, designed for carrying ten passengers or less and used for the transportation of persons (passenger car or vehicle) and any motor vehicle propelled by gasoline combustion power designed, used, or maintained primarily for the transportation of property which has a gross vehicle weight rating of less than 8,500 pounds (light-duty truck), excluding:

(A) Any motor vehicle not designed primarily for highway use; and;

(B) Any motor vehicle manufactured in a model year ending more than 11 calendar years prior to January 1 of the calendar year in which this part is being or is sought to be enforced.

(23) "USEPA" means the United States Environmental Protection Agency.

40-8-154. Responsible agencies and officials.

The Department of Public Safety and the commissioner of public safety are designated as the state agency and official, respectively, to implement the inspection and certification requirements of this part as further provided in this part.

The Board of Natural Resources and the director of the Environmental Protection Division of the Department of Natural Resouces are designated as the state agency and official, respectively, to establish emission standards and standards and procedures governing equipment, personnel, and facilities conducting required inspections as further provided in this part.

40-8-155. Application of part.

This part shall operate uniformly throughout the state. In all counties of this state wherein there are registered or licensed, pursuant to or subject to the requirements of Chapter 2 of this title, as of May 1 of a given calendar year, in any calendar year after the enactment of this part, more than 200,000 motor vehicles as defined in this part, all the provisions or requirements of this part shall apply to any such county for a period of 12 months immediately following May 1 of such calendar year.

40-8-156. Certificates of emission inspection required for vehicles in certain counties.

(a) In each county having more than 200,000 motor vehicles registered or licensed as of May 1 of a given calendar year, as specified in Code Section 40-8-155, there is required within the 12 month period following May 1 of such calendar year, for any period after April 1, 1981, a certificate of emission inspection issued by an emission inspection station certified under this part for each responsible motor vehicle registered or licensed pursuant to or subject to the requirements of Chapter 2 of this title in such county during such 12 month period following May 1 of such calendar year. A certificate of emission inspection is also required for each responsible motor vehicle owned by any state agency, municipality, or other political subdivision registered or licensed pursuant to Code Section 40-2-34 or 40-2-35, whichever is applicable, and assigned for use during such 12 month period following May 1 of such calendar year to any state agency, municipality, or other political subdivision located in such county.

(b) Such certificate of emission inspection must certify for any such responsible motor vehicle:

(1) An inspection of emissions of hydrocarbons and carbon monoxide, as required by Code Section 40-8-158;

(2) Compliance, as required by Code Section 40-8-158, with applicable emission standards or emission limitations for hydrocarbons and carbon monoxide specified for such vehicle by the board pursuant to Code Section 40-8-157;

(3) Inspection, as required by Code Section 40-8-158, of emission control equipment which was required to be installed on such motor vehicle when new by the Federal Clean Air Act; and

(4) Maintenance, as required by Code Section 40-8-158, of emission control equipment which was required to be installed on such motor vehicle when new by the Federal Clean Air Act.

(c) Such a certificate of emission inspection for responsible motor vehicles shall be required in a county during a 12 month period following May 1 of a given calendar year only during the period after such county or some part thereof has been continuously designated for a period of at least 12 months by USEPA, pursuant to the authority of the Federal Clean Air Act, as having ambient air levels of either photochemical oxidants (ozone) or carbon monoxide in excess of the National Ambient Air Quality Standard for such pollutant.

(d) When the requirements of this Code section initially become applicable in a county which is subject to the provisions of this part under Code Section 40-8-155 on a date subsequent to May 1 of a given calendar year, then the period allowed for obtaining a certificate of emission inspection shall be 12 months following the date such certificate initially became required under this Code section. In such a case, the entire 12 month period following the date such certificate initially became required under this Code section shall be considered the initial 12 month period of applicability for purposes of subsection (e) of Code Section 40-8-158.

(e) Except as otherwise provided in subsection (d) of this Code section, all responsible motor vehicles becoming subject to the requirements of this Code section during any 12 month period following May 1 of a given calendar year shall comply with such requirements before May 1 of the next calendar year.

(f) The requirements of paragraphs (1) through (4) of subsection (b) of this Code section shall remain in effect in a county only during such time as such county or some part thereof continues to be designated by USEPA pursuant to the Federal Clean Air Act as having ambient air levels of either photochemical oxidants or carbon monoxide in excess of the NAAQS for such pollutant.

(g) Notwithstanding the other provisions of this Code section, the requirements of this part shall not apply to vehicles registered or licensed as specified in subsection (a) of this Code section where the owner of such vehicle certifies, under oath and subject to the monetary penalties as provided in Code Section 16-10-71 upon conviction for false swearing therein, that:

(1) Such vehicle is so registered or licensed by a Georgia resident on active duty in the armed services of the United States then residing outside the State of Georgia;

(2) At the time this part is being or is sought to be enforced with respect to such vehicle, the owner's domicile or, if such vehicle is primarily used in connection with some established business enterprise, such established business enterprise is not located in any county wherein any responsible motor vehicle is subject to the requirements of this part; or

(3) Such vehicle is or will be, during the 12 month period of applicability of the part during which the part is being or is sought to be enforced with respect to such vehicle, permanently assigned or let for use to a person not domiciled or an established business enterprise not located in any county wherein any responsible motor vehicle is subject to the requirements of this part.

The commissioner shall provide the form for any such certification.

40-8-157. Powers and duties of Board of Natural Resources.

The board shall have the following powers and duties under this part:

(1) To prescribe or specify by rule or regulation emission standards or emission limitations limiting the amounts of allowable exhaust emissions and evaporative emissions of hydrocarbons and carbon monoxide from responsible motor vehicles as defined in this part. Such standards may specify the amount of allowable emissions by part per million, percentage of total volume or weight of emissions, or such other method as the board selects. In no event shall the emission limitations be stricter than those originally required by the USEPA pursuant to the Federal Clean

Air Act, as amended, for the particular vehicle to which such limitations apply. Such emission limitations and emission standards may distinguish between model years, engine types and sizes, trucks and passenger vehicles, or weights of vehicles and may be applicable to groups of vehicles classed according to any such distinctions. Such emission limitations shall be technically feasible. The department may provide by rule or regulation for the method of application of such standards to vehicles with engines of a model year different from the vehicle model year;

(2) To prescribe by rule or regulation equipment standards, requirements, or specifications for any inspection equipment used to test, measure, inspect for, or determine compliance by a responsible motor vehicle or any responsible motor vehicle equipment with the standards, limitations, or other requirements established by or under the authority of this part;

(3) To prescribe by rule or regulation standards and qualifications for mechanic inspectors authorized to operate inspection equipment to inspect responsible motor vehicles or responsible motor vehicle equipment for compliance with standards, limitations, or other requirements established by or pursuant to this part;

(4) To prescribe by rule or regulation operating techniques, specifications, procedures, requirements for records maintenance, criteria, and other requirements applicable to emission inspection stations authorized to inspect responsible motor vehicles or responsible motor vehicle equipment for compliance with the standards, limitations, or other requirements established by or pursuant to this part; and

(5) To advise, consult, cooperate, and contract with other state agencies, any political subdivision of the state, or any designated organizations of elected officials within the state, as necessary to implement and adequately enforce and ensure compliance with any requirement created, provided, prescribed, or established by the board pursuant to this part. With respect to the powers vested in the board pursuant to this paragraph, the board may designate the director of the Environmental Protection Division of the Department of Natural Resources as its agent in exercising the powers so vested.

40-8-158. Periodic inspection and maintenance.

(a) Each responsible motor vehicle subject to any requirement under Code Section 40-8-156 must receive a certificate of emission inspection once during any 12 month period during which Code Section 40-8-156 applies to such responsible motor vehicle from an emission inspection station holding a valid certificate of authorization from the department. A certificate of emission inspection shall be issued for such a responsible motor vehicle if, upon inspection by a permitted mechanic inspector, the mechanic inspector determines, consistent with the terms of Code Section 40-8-156, with respect to such responsible motor vehicle:

(1) That any emission control equipment required on such responsible motor vehicle when new by the federal Clean Air Act has been inspected to determine whether such equipment has been rendered unserviceable by removal, alteration, or other interference with its operation;

(2) That any emission control equipment required on such responsible motor vehicle when new by the federal Clean Air Act has not been rendered unserviceable by removal, alteration, or other interference with its operation (unless replaced with equipment of demonstrated equivalent emission reduction capabilities);

(3) That an inspection of the exhaust and evaporative emissions of hydrocarbons and carbon monoxide from such responsible motor vehicle has been performed; and

(4) That the exhaust emissions and evaporative emissions from the responsible motor vehicle do not exceed any applicable emission standard or emission limitation for allowable emissions of hydrocarbon or carbon monoxide prescribed by the board pursuant to this part. Compliance with any applicable emission standard or emission limitation shall be determined by mechanic inspectors meeting qualifications, using methods, techniques, and equipment, under conditions, and following inspection procedures prescribed by the board pursuant to this part.

(b) If the inspection discloses any violation of any applicable emission standard or emission limitation, then the owner shall be notified, in writing, of the air pollutant which exceeds the allowable emissions and the degree of excess.

(c) The owner shall have necessary maintenance and repairs performed and return for reinspection at an emission inspection station within 15 days of the initial inspection. Such reinspection shall be at no charge to the owner. If, upon reinspection, such motor vehicle fails to meet the requirements of subsection (a) of this Code section, no certificate of emission inspection shall be issued unless the owner proves, by means of repair facility receipts or other written documents, that:

(1) He has replaced any emission control and exhaust system equipment or part thereof which has been removed, physically damaged, or otherwise rendered inoperable;

(2) He has spent at least $50.00 in the repair and maintenance of the responsible motor vehicle evaporative (as applicable) emission control systems and related equipment, apart from the replacement or repair of emission control devices and exhaust systems, since the first inspection in the current 12 month period of applicability of Code Section 40-8-156; and

(3) Such repairs and maintenance have produced a decrease in exhaust and evaporative emissions (as applicable) since the first inspection in the current 12 month period of applicability of Code Section 40-8-156.

(d) As used in this Code section, the term 'initial 12 month period of applicability' means, for a given county, the 12 month period following May 1 of a given calendar year, or the 12 month period following the date on which the requirements of Code Section 40-8-156 otherwise become applicable, when such county became subject to any requirement under Code Section 40-8-156 for the first time. Any county which has been subject to any requirement under this part, again becoming subject to any requirement under this part subsequent to an intervening period during which such county was not subject to any requirement under this part, shall be considered to be in an initial year of applicability upon again becoming subject to any requirement under this part in such manner.

(e) Following the initial 12 month period of applicability, a certificate of emission inspections shall be displayed on a vehicle which has been inspected and has been approved as meeting the requirements of this part and shall bear the date the vehicle was inspected, the number or other identification of the inspecting station, the signature of the mechanic inspector performing the inspection, and such other information as shall be required by the commissioner. The mechanic inspector shall remove from the vehicle being inspected any old certificate of emission inspection when a new certificate of emission inspection will be issued. At the time an emission inspection station issues a certification of emission inspection, the station shall also issue an emission inspection verification which may be used in complying with Code Section 40-8-159.1. This verification shall contain all information shown on the certificate of emission inspection, shall be issued in duplicate, and shall be on such forms as the department shall prescribe.

(f) All certificates of emission inspection shall be issued for a period of one year.

(g) A new responsible motor vehicle otherwise required under Code Section 40-8-156 to have an inspection or certificate of inspection shall not be required to have either that inspection or certificate at the time of the initial retail sale or delivery of that vehicle, but the required inspection and certificate of inspection shall be obtained prior to the time the initial owner first transfers such vehicle or within 12 months following the date of the initial sale of the vehicle when new, whichever occurs first. With respect to any inspection or certificate of inspection required for a responsible motor vehicle at the time of the initial retail sale of such vehicle when new, the department may provide for the issuance of certificates of inspection for such vehicle by the franchised dealer selling the vehicle, provided such dealer first determines that such vehicle meets the applicable requirements of the federal Clean Air Act.

(h) The commissioner may establish methods by which the owner of a responsible motor vehicle who has lost the certificate of emission inspection or emission inspection verification required in any 12 month period may have an additional or duplicate certificate of emission inspection or emission inspection verification issued to him. These methods may include but are not necessarily limited to the following two methods:

(1) Any approved emission inspection station may issue said additional or duplicate certification or emission inspection verification upon the owner demonstrating to the mechanic inspector that the responsible motor vehicle has a current and valid inspection sticker affixed to its window; or

(2) The commissioner shall issue said addtional or duplicate certification or emission inspection verification upon the owner demonstrating to the commissioner that said vehicle had been inspected previously and had obtained a current and valid inspection sticker.

(i) In the event a windshield shall be replaced upon any vehicle which contains a valid emission inspection sticker, a new emission inspection sticker may be issued for such vehicle within 15 days after the replacement of the windshield without the necessity of reinspection if the owner of the vehicle shall execute an affidavit in a form furnished by the commissioner stating that the windshield of his vehicle has been replaced and giving such other information as the commissioner shall require and shall pay to the inspection station a fee of 50c. The new emission inspection sticker shall be valid only for the remainder of the period for which the replaced emission inspection sticker was to be valid. The vehicle may be operated on the highways without an emission inspection sticker for 15 days after the replacement of the windshield if proof of the date of such replacement is carried in the vehicle.

40-8-159. Certification of emission inspection stations; permits for mechanic inspectors; duties of inspection stations.

(a) The commissioner shall issue a certificate of authorization and certificates of emission inspection and furnish instructions to all emission inspection stations so that such stations may carry out the responsible motor vehicle emission inspections and responsible motor vehicle emission control equipment inspections required by this part. Application for a certificate of authorization under this part shall be made upon an official form designated by the commissioner and shall be granted only when the commissioner is satisfied that the station is properly equipped and has the necessary mechanic inspectors to make the inspections required by this part.

(b) The commissioner, prior to issuing a certificate of authorization, shall require proof that the applicant possesses a valid garage owner's liability insurance policy or has filed a bond in a form and amount satisfactory to the commissioner to ensure compensation for any damage to a vehicle during an inspection or adjustment caused by negligence of the applicant or its agent.

(c) The commissioner shall provide a procedure for permitting mechanic inspectors under this part. Applications for permits shall be as directed by the commissioner.

(d) With respect to any certificate of authorization issued to any emission inspection station licensed, authorized, or certified by the department to inspect responsible motor vehicle emissions and responsible motor vehicle emission control equipment for compliance with the requirements of this part, the following shall apply:

(1) The department shall ensure the operation of such official emission inspection stations of a number, at locations, and in a condition satisfactory to the department and in conformance with all standards, requirements, and specifications prescribed for such inspection stations, procedures, personnel, and equipment by the board pursuant to this part; and each official emission inspection station shall keep a record of inspections, reinspections, the results thereof, and certificates of inspection issued in a manner designated by the department and in conformance with any requirements for such records and reports prescribed by the board. All records required in this part to be maintained by an official emission inspection station shall be available for inspection at all reasonable times;

(2) Any official emission inspection station licensed, permitted, or established under this Code section shall be required to perform inspections on responsible motor vehicles in conformity with regulations or requirements established, prescribed, or promulgated by the board pursuant to this part. Such requirements shall ensure that uniform equipment is utilized and that emission inspections produce consistent results throughout affected areas of the state;

(3) A fee of not less than $7.50 nor more than $10.00 shall be charged by each emission inspection station for performance of the emission inspection and emission control equipment inspection required by this part. Such fee does not include any required maintenance. The station shall be required to remit to the commissioner an administrative fee of 50c, one-half of which shall be a county administrative fee, for each certificate of emission inspection issued, and the commissioner shall remit quarterly the county portion of such administrative fees to the county governing authorities of the counties wherein the inspections were performed;

(4) The department shall supervise and cause inspections to be made of the emission inspection stations permitted, certified, or established pursuant to this law and shall ensure compliance with all applicable requirements of, under, or pursuant to this part relating to such inspections, inspection stations, and inspection personnel;

(5) No certificate of authorization for an emission inspection station shall be assigned or transferred or used in any location other than the one designated on such certificate; and

(6) Every certificate of authorization and mechanic inspector permit shall be posted in a conspicuous place in the station.

40-8-159.1. Proof of emission inspection as prerequisite to issuing license or operating motor vehicle. (a) Beginning January 1, 1986, it shall be unlawful for any county to and no county shall register or issue a license for any responsible motor vehicle subject to any requirement under Code Section 40–8–156 pursuant to or subject to the requirements of Chapter 2 of this title unless the owner provides a certificate of emission inspection or an emission inspection verification form issued pursuant to subsection (e) of Code Section 40–8–158 indicating that the responsible motor vehicle satisfied all applicable requirements of Code Section 40–8–156 and Code Section 40–8–158. In applying for a vehicle license plate or revalidation sticker for a responsible motor vehicle subject to any requirement under Code Section 40–8–156 by mail, the application shall be accompanied by an emission inspection verification form issued pursuant to subsection (e) of Code Section 40–8–158.

(b) It shall be unlawful to and no person shall operate a responsible motor vehicle subject to any requirement under Code Section 40-8-156 on the roadways of this state without a valid registration or license issued in compliance with this part. Any person who operates a responsible motor vehicle subject to any requirement under Code Section 40-8-156 on the roadways of this state without a valid registration or license issued in compliance with this part shall be considered to be operating an unregistered motor vehicle.

40–8–160. Sales of responsible motor vehicles.

No person shall sell any motor vehicle which is intended for highway use if such vehicle is at the time of the sale a responsible motor vehicle required to have a certificate of emission inspection under Code Section 40–8–156, unless there appears on such vehicle an unexpired valid certificate of emission inspection issued pursuant to this part. Any person violating this Code section shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of $25.00 for a first offense, $100.00 for a second offense, and $500.00 for each subsequent offense. If, as a result of the sale of a responsible motor vehicle subject to any requirement under Code Section 40–8–156, such motor vehicle would not, if immediately registered or licensed (as specified in Code Section 40–8–155) by the purchaser as provided by law, be registered or licensed in a county in which the requirements of Code Section 40–8–156 are applicable, this Code section shall not apply.

40–8–161. Unlawful acts; penalty.

(a) Improper representation as official emission inspection station.

(1) No person shall in any manner represent any place or establishment as an official emission inspection station unless such station has been issued a valid certificate of authorization by the department.

(2) No person shall issue a certificate of emission inspection for any responsible motor vehicle unless such person holds a valid certificate of authorization issued pursuant to this part and such vehicle has been inspected and approved by a permitted mechanic inspector as required by this part.

(b) False certificates of emission inspection.

(1) No person shall make, issue, or knowingly use any imitation or counterfeit of an official certificate of emission inspection.

(2) No person shall possess, display, or cause or permit to be displayed upon any vehicle any certificate of emission inspection knowing the same to be counterfeit or issued for another vehicle or issued without the required inspection and approval.

(3) No person shall use for the purpose of proof under subsection (c) of Code Section 40-8-158 any receipt or document purporting to show cost of repair or maintenance or replacement of equipment unless such receipt or document accurately represents costs actually incurred by such person with respect to the responsible motor vehicle for which the certificate of emissions is sought.

(c) Operation of responsible motor vehicle without certificate of emission inspection. It shall be unlawful for any person to operate or permit to be operated on any highway of this state a responsible motor vehicle registered or licensed in any county subject to this part pursuant to or subject to the requirements of Chapter 2 of this title, which is at the time of operation required to have a certificate of emission inspection under Code Section 40-8-156, without a valid official certificate of emission inspection being displayed on such vehicle. For purposes of this subsection, each day of operation or permission is a separate offense.

(d) Unlawful registration or licensing of responsible motor vehicle. It shall be unlawful to register or license, or cause to be registered or licensed, a responsible motor vehicle in any county other than the county wherein such vehicle is required to be registered or licensed by Chapter 2 of this title for the purpose of avoiding any requirement of this part. Each day of continued unlawful registration or licensure shall be a separate offense.

(e) Rendering equipment unserviceable. With respect to any responsible motor vehicle subject to any requirement under this part, it shall be unlawful for the purpose of avoiding any requirement of this part to render unserviceable by removal, alteration, or other interference with its operation any emission control equipment required on such responsible motor vehicle when such vehicle was new by the federal Clean Air Act. Each day of such unserviceability shall be a separate offense.

(f) Penalty. Any person violating any provision of this part (excluding Code Section 40-8-160) shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not less than $25.00 nor more than $100.00.

(g) Issuance of license without proof of emission inspection. If it is determined that any county has registered or issued licenses for responsible motor vehicles without receiving proof from the owners that the responsible motor vehicles satisfy all applicable requirements of Code Section 40-8-156 and Code Section 40-8-158, the commissioner of public safety shall notify the commissioner of transportation that such an unlawful act has occurred. Upon such notification, the State Transportation Board may at its discretion withhold Department of Transportation funding assistance from any such county.

40-8-162. Rules and regulations.

(a) The Board of Public Safety is authorized to implement any and all provisions of this part assigned by the terms of this part to it or to the department and to promulgate such rules and regulations as are necessary for the proper implementation thereof.

(b) When duly promulgated and adopted, all rules and regulations issued pursuant to this part by either the commissioner of public safety under this Code section or the Board of Natural Resources under Code Section 40-8-157 shall have the force of law.

40-8-163. Effect of Federal Clean Air Act on operation of part.

This part, the "Georgia Motor Vehicle Emission Inspection and Maintenance Act" shall remain of force and effect only so long as the Federal Clean Air Act (42 U.S.C. 1857, et seq., as amended) shall require that the State of Georgia maintain and enforce the inspection plan and program provided for in this part in order to reduce the ambient air levels of photochemical oxidants or carbon monoxide which exceed the levels specified by the National Ambient Air Quality Standards for such pollutants specified by the United States Environmental Protection Agency pursuant to said Act. Upon the effective date of an amendment to the Federal Clean Air Act which shall allow the State of Georgia to discontinue the maintenance and enforcement of the inspection plan and program provided for in this part without the imposition of sanctions against the State of Georgia such as the loss of federal funds for sewage treatment plants, transportation projects, and air quality improvement projects, this part shall be repealed.

Part 3
Visible Emissions

40-8-180. Short title.

This part may be cited as the "Vehicular Visible Emission Control Act."

40-8-181. Visible emissions from vehicles on public roadways prohibited; exceptions.

(a) It shall be unlawful for any person to operate on a public roadway of this state a diesel powered vehicle which discharges into the atmosphere visible emissions resulting in a decrease of light transmission beyond 30 percent, whether emitted from the crankcase, the exhaust system, or from any part of the power system; provided, however, that the light obscuring limitations prescribed in this subsection may be exceeded during periods of acceleration and deceleration not to exceed ten continuous seconds or 1,000 feet.

(b) It shall be unlawful for any person to operate on a public roadway of this state a gasoline powered vehicle which discharges into the atmosphere visible emissions resulting in a decrease of light transmission, whether emitted from the crankcase, the exhaust system, or from any part of the power system; provided, however, that the light obscuring limitation prescribed in this subsection may be exceeded for periods not to exceed ten continuous seconds or 1,000 feet.

(c) Subsections (a) and (b) of this Code section shall not apply to the normal discharge of condensed water vapor.

40-8-182. Enforcement of part; traffic violation citations.

(a) This part shall be enforced by the duly authorized traffic control agency of this state or of any political subdivision thereof. The Air Quality Control Agency of this state shall produce and furnish to such traffic control agency appropriate light transmission gauges to be used in the enforcement of this part.

(b) A traffic violation citation shall be issued to the operator of a vehicle in violation of any provision of this part on and after January 1, 1973.

40-8-183. Penalty.

Any person who violates any provision of this part shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not less than $10.00 nor more than $25.00.

40-8-184. Municipal and county regulation prohibited.

No subdivision of this state shall enact any ordinance or issue any rules and regulations pertaining to the discharging into the atmosphere of visible emissions from diesel powered vehicles or gasoline powered vehicles.

40-8-185. Part not applicable to certain vehicles.

This part shall not apply to off-highway farm, forest, and construction equipment being moved from one work location to another.

ILLINOIS

ILLINOIS MOBILE SOURCES STANDARDS

(Illinois Administrative Code Title 35 — Environmental Protection; Subtitle B — Air Pollution, Chapter 1 — Pollution Control Board, Part 240; Adopted effective April 14, 1972; Amended January 31, 1974, and February 7, 1974; Recodified effective October 1, 1983; Amended effective June 16, 1986)

Subpart A: Definitions and General Provisions

240.101 Preamble.

As the state of knowledge and technology relating to the control of emissions from motor vehicles shall permit and make appropriate, and in furtherance of the purposes of the Environmental Protection Act (Ill. Rev. Stat. 1981, ch. 111½, pars. 1001 et seq.) (Act), the Pollution Control Board (Board) shall provide for by rules and regulations the control of emissions from motor vehicles. Such rules and regulations shall prescribe requirements for the installation and use of equipment designed to reduce or eliminate emissions and for the proper maintenance of such equipment and of vehicles. Any rules and regulations pursuant to this section shall be consistent with provisions of federal law, if any, relating to control of emissions from the vehicles concerned.

240.102 Definitions.

All terms which appear in this Part have the definitions specified in this Part and 35 Ill. Adm. Code 201 and 211.

"Diesel Engine": All types of internal-combustion engines in which air is compressed to a temperature sufficiently high to ignite fuel injected directly into the cylinder area.

"Diesel Locomotive": A diesel engined vehicle designed to move cars on a railway.

"Fleet": Five or more vehicles.

"Heavy Duty Vehicle": a motor vehicle rated at more than 8000 pounds gross vehicle weight.

"High Idle": that portion of a two-speed idle test conducted with the engine operating at a speed of approximately 2500 RPM.

"Idle Mode": that portion of a vehicle emission test procedure conducted with the engine disconnected from an external load and operating at minimum throttle.

"Light Duty Truck": a motor vehicle rated at 8000 pounds gross vehicle weight or less, which is designed for carrying more than 10 persons or designed for the transportation of property, freight or cargo, or is a derivative of such a vehicle.

"Light Duty Vehicle": a passenger car designed to carry not more than 10 persons.

"Model Year": the year of manufacture of a motor vehicle based upon the annual production period as designated by the manufacturer and indicated on the title and registration of the vehicle. If the manufacturer does not designate a production period for the vehicle, then "model year" means the calendar year of manufacture.

"Motor Vehicle": As used in this section "motor vehicle" shall have the same meaning as in the Illinois Vehicle Code, Ill. Rev. Stat. 1981, ch. 95½, par. 1-146.

"Opacity": A condition which renders material partially or wholly impervious to the transmittance of light, and causes the obstruction of an observer's view.

"Persons Liable": All persons owning, operating or in charge of control of any equipment who shall cause or permit or participate in any violation of these rules and regulations either as owner, operator, lessee or lessor.

"Two-Speed Idle Test": a vehicle emission test procedure consisting of the measurements of exhaust emission in high idle and idle modes.

240.103 Prohibitions.

Except as permitted or authorized by law, no person shall fail to maintain in good working order or remove, dismantle or otherwise cause to be inoperative any equipment or feature constituting an operational element of the air pollution control systems or mechanisms of a motor vehicle as required by rules or regulations of the Board and the United States Environmental Protection Agency to be maintained in or on the vehicle.

240.104 Inspection.

All motor vehicles subject to inspection pursuant to Section 13A-104 of the Illinois Vehicle Emissions Inspection Law (Ill. Rev. Stat. 1985, Ch. 95½ par, 13A-104) shall comply with the exhaust emission standards for carbon monoxide and hydrocarbons set forth at Section 240.124 of this Part.

240.105 Penalties.

(a) Any violations of Sections 240.103, 240.121, 240.122, and 240.123 shall be subject to the penalties as set forth in Section 42 of the Act (Ill. Rev. Stat. 1985, ch. 111½, par. 1042).

(b) Any violations of Sections 240.104 and 240.124 shall be subject to the penalties as set forth in Sections 13A-112 and 13A-113 of the Vehicle Emissions Inspection Law (Ill. Rev. Stat. 1985, ch. 95½, par. 13A-112, 13A-113).

240.106 Determination of Violation.

(a) Any violation of Sections 240.103, 240.121, 240.122, and 240.123 of this Part shall be determined by visual observation, or by a test procedure employing an opacity measurement system as qualified by 35 Ill. Adm. Code 201, Subpart J.

(b) Any violations of Section 240.124 shall be determined in accordance with test procedures adopted by the Agency.

Subpart B: Emissions

240.121 Smoke Emissions.

(a) There shall be no visible emissions of smoke from a motor vehicle, zero opacity.

(b) Motor vehicles traveling Illinois public highways from out of State must comply with subsection (a).

(c) No used motor vehicle shall be sold or transferred in Illinois unless that said vehicle meets subsection (a).

240.122 Diesel Engine Emission Standards.

(a) The visible emission standard in Section 240.121 shall not apply to diesel engines.

(b) With the exception of subsection (e), diesel engines manufactured before January 1, 1970, shall not be operated in such a manner as to emit smoke which is equal to or greater than 30% opacity except for individual smoke puffs. Individual puffs of smoke shall not exceed 15 seconds in duration.

(c) (1) Diesel engines shall be operated only on the specific fuels as specified in the engine manufacturers' specifications for that specific engine, or on fuels exceeding engine manufacturers' specifications.

(2) Persons liable for operating diesel engined fleets wholly within standard metropolitan statistical areas shall furnish to the Environmental Protection Agency, once each year, proof that the fuel purchased and used in their operations conforms to subsection (c)(1).

(d) All diesel engines operated on public highways in Illinois coming from out of the State shall conform to subsection (b).

(e) (1) No person shall cause or allow the emission of smoke from any diesel locomotive in the State of Illinois to exceed thirty percent (30%) opacity.

(2) Subsection (e)(1) shall not apply to:

(A) Smoke resulting from starting a cold locomotive: for a period of time not to exceed 30 minutes.

(B) Smoke emitted while accelerating under load from a throttle setting other than idle to a higher throttle setting: for a period of time not to exceed 40 seconds.

(C) Smoke emitted upon locomotive loading following idle: for a period of time not to exceed 2 minutes.

(D) Smoke emitted during locomotive testing, maintenance, adjustment, rebuilding, repairing or breaking in: for a period of time not to exceed 3 consecutive minutes and an aggregate of 10 minutes in any 60 minute period.

(E) Smoke emitted by a locomotive which because of its age or design makes replacement or retrofit parts necessary to achieve smoke reduction unavailable. These locomotives shall be retired at the earliest possible time.

240.123 Liquid Petroleum Gas Fuel Systems.

(a) Motor vehicles which are solely fueled with liquid petroleum gas shall have excess air injection systems made inoperative, where such systems are installed by the vehicle manufacturers.

(b) (1) Motor vehicles which operate on liquid petroleum gas or gasoline fuels alternately, in dual fuel systems, shall have excess air injection systems inoperative when operating on liquid petroleum gas where excess air injection systems are installed by the vehicle manufacturers.

(2) Motor vehicles which operate on liquid petroleum gas or gasoline fuels alternately in a dual fuel system, shall have excess air injection systems operational when operating on gasoline, where excess air injection systems are installed by the vehicle manufacturers.

(3) Motor vehicles which operate on liquid petroleum gas or gasoline fuels alternately in a dual fuel system, shall have the intake manifold heat riser system to the carburetor operational at all times when the motor vehicles are operating.

240.124 Vehicle Exhaust Emission Standards

(a) Exhaust emissions from light duty vehicles shall not exceed the following limitations:

Model Year	Carbon Monoxide (%)	Hydrocarbons as Hexane (ppm)
1968 — 1971	9.0	900
1972 — 1974	8.0	800
1975 — 1977	7.0	700
1978 — 1979	6.0	600
1980	3.0	300
1981 and later	1.2	220

(b) Exhaust emissions from light duty trucks shall not exceed the following limitations:

Model Year	Carbon Monoxide (%)	Hydrocarbons as Hexane (ppm)
1968 — 1971	9.0	900
1972 — 1974	8.0	800
1975 — 1978	7.0	700
1979 — 1980	6.0	600
1981 — 1983	3.0	300
1984 and later	1.2	220

(c) Exhaust emissions from heavy duty vehicles shall not exceed the following limitations:

Model Year	Carbon Monoxide (%)	Hydrocarbons as Hexane (ppm)
1968 — 1971	9.5	1500
1972 — 1978	9.0	900
1979 — 1984	7.0	700
1985 and later	3.0	300

240.125 Compliance Determination

For purposes of determining compliance with Section 240.124 of this Part, all vehicles shall be inspected while operating in the idle mode, and all 1981 and later model year light duty vehicles and light duty trucks shall be inspectd at high idle during a two-speed idle test.

Appendices A and B [Omitted]

INDIANA

department of environmental management.

326 IAC 12-1-3 Availability of regulations

Sec. 3. (a) The federal regulations adopted by reference appear in 40 CFR 60.

(b) Copies of the Code of Federal Regulations (CFR) referenced in 326 IAC 12 may be obtained from the Government Printing Office, Washington, D.C. 20402 or from the Department of Environmental Management, Office of Technical Assistance, 105 South Meridian Street, Indianapolis, Indiana 46225.

ARTICLE 13. MOTOR VEHICLE EMISSION AND FUEL STANDARDS

Rule 1. Motor Vehicle Inspection and Maintenance Requirements

326 IAC 13-1-1 Applicability and general requirements

Sec. 1. (a)(1) All motor vehicles registered or reregistered in Clark, Floyd, Lake and Porter Counties for highway use, and motor vehicles registered or reregistered outside these counties used to commute to employment in any of these counties, are subject to the requirements of 326 IAC 13-1. All owners and operators of motor vehicles subject to the provisions of 326 IAC 13-1 shall maintain their motor vehicles and any air pollution control equipment on the motor vehicles in good working order such that they meet the emission standards specified in 326 IAC 13-1. Any failure to maintain in good working order or removal, dismantling, or causing of inoperability of any air pollution control equipment shall subject the owner or operator to suspension of the registration for the motor vehicle by the commissioner of the bureau of motor vehicles.

(2) The following motor vehicles are exempt from the sticker and testing requirements of 326 IAC 13-1:

(A) heavy duty motor vehicles;

(B) motorcycles;

(C) motor vehicles with engine displacement less than two hundred (200) cubic centimeters;

(D) farm tractors and other off highway construction equipment;

(E) motor vehicles registered as a recreational vehicle (RV);

(F) motor vehicles owned or leased by the United States, the state, local governmental units and fleet owned motor vehicles if one-half (1/2) or less of such vehicles' mileage is accumulated in the above listed counties;

(G) motor vehicles registered in any state adjacent to Indiana that are subject to a motor vehicle inspection and maintenance program.

(3) The following motor vehicles are exempt from the testing requirements of 326 IAC 13-1 but must obtain and display an exemption sticker:

(A) motor vehicles using diesel fuel; and

(B) reconstructed motor vehicles with an engine year, in even numbered years of thirteen (13) years or older and in odd numbered years, of fourteen (14) years or older, as identified by the engine identification number; and

(C) motor vehicles, in even numbered years, which are thirteen (13) years or older; and

(D) motor vehicles, in odd numbered years, which are fourteen (14) years or older.

(4) The following motor vehicles are exempt from the sticker and testing requirements of 326 IAC 13-1 for a period of thirty (30) days after initial title or registration:

(A) new motor vehicles; and

(B) motor vehicles purchased outside one (1) of the applicable counties and registered in one (1) of these counties for the first time.

(b) The owner or operator of any motor vehicle specified in subsections (a)(1), (3), and (4) of this section, shall comply with 326 IAC 13-1-3.

(c) The owner or operator of any motor vehicle not listed as exempt in subsection (a)(2) of this section shall have such vehicle tested and retested periodically.

326 IAC 13-1-2 Definitions

Sec. 2. The following terms used in 326 IAC 13-1 are defined as follows:

"Bureau" means the Indiana bureau of motor vehicles.

"Compliance sticker" means a window sticker issued to motor vehicles passing the inspection or granted a waiver pursuant to 326 IAC 13-1-7(e).

"Department" means the department of environmental management, office of air management.

"Exemption sticker" means a window sticker issued in accordance with 326 IAC 13-1-3(b)(3) to motor vehicles exempt from the inspection requirements of 326 IAC 13-1.

"Facility" means a motor vehicle testing location, either mobile or stationary, operated by Ivy Tech and established in accordance with 326 IAC 13-1-10.

"Fleet" means a group of light duty motor vehicles, medium duty motor vehicles or a combination thereof owned or operated by an individual, a company, a corporation, or a federal, state, or local government unit.

"Heavy duty motor vehicle" means a motor vehicle registered as a truck 11 (11,000 lbs.) or greater, a tractor 20 (20,000 lbs.) or greater, a bus, and a government motor vehicle so identified.

"Interim sticker" means a window sticker issued in accordance with 326 IAC 13-1-3(b)(1) to all motor vehicles subject to 326 IAC 13-1.

"Ivy Tech" means Indiana vocational technical college.

"Light duty motor vehicle" means a motor vehicle registered as a passenger motor vehicle, (except vans registered as passenger motor vehicles), a station wagon registered as a truck 7 (7,000 lbs. gross vehicle weight) and a government motor vehicle so identified.

"Medium duty motor vehicle" means a motor vehicle registered as a truck 7 (7,000 lbs.) (except a station wagon registered as truck 7), or a truck 9 (9,000 lbs.) and a van registered as a passenger motor vehicle and a government motor vehicle so idenitified.

"Motorcycle" means a motor vehicle having a seat or saddle for the rider and designed to travel on not more than three (3) wheels in contact with the ground.

"Motor vehicle" means a light or medium duty internal combustion engine motor vehicle used on the public roads.

"Motor vehicle emission inspector" means an individual meeting the requirements of 326 IAC 13-1-11.

"Motor vehicle model year or model year" means the date of manufacture of the original motor vehicle within the annual production period of such motor vehicle as designated by the manufacturer.

"New motor vehicle" means a light or medium duty motor vehicle registered for highway use whose model year is the present calendar year or the present calendar year plus one (1).

"New vehicle sticker" means a window

sticker issued in accordance with 326 IAC 13-1-3(b)(2).

"Repair sticker" means a window sticker issued in accordance with 326 13-1-3(b)(5).

"Reconstructed motor vehicle" means any vehicle that has had an engine replacement and the model year of the vehicle is no longer identical to the year of the engine as determined by the engine identification number.

"Replacement sticker" means any sticker used to replace a sticker that has been destroyed. A sticker can only be replaced by the same type of sticker and proof of destruction must be shown.

326 IAC 13-1-3 Issuance and display of stickers; testing schedule

Sec. 3. (a) All light and medium duty motor vehicles subject to 326 IAC 13-1 shall display one (1) of the following types of valid emission stickers:

(1) interim sticker;
(2) new vehicle sticker;
(3) exemption sticker;
(4) compliance sticker;
(5) repair sticker.

(b) All light and medium duty motor vehicles subject to this rule (326 IAC 13-1) will be issued one (1) of the above stickers in the following manner:

(1) Issuance of interim sticker. An interim sticker may be issued to vehicles subject to 326 IAC 13-1 when a compliance, repair, exempt, or new vehicle sticker cannot be issued.

(2) Issuance of new vehicle sticker.

(A) A new vehicle sticker will be issued to a new motor vehicle by the bureau during a registration transaction.

(B) A new motor vehicle sticker shall be displayed on a new motor vehicle within thirty (30) days of initial registration.

(C) The bureau will indicate on the new vehicle sticker the due date for the vehicle's initial test. The bureau will determine the due date by the last three (3) digits of the vehicle identification number.

(3) Issuance of exemption sticker. An exemption sticker will be issued in the following manner:

(A) a light or medium duty vehicle with a model year defined in 326 IAC 13-1-1(a)(3)(C) and (D) will be issued an exemption sticker by the bureau during a registration transaction;

(B) a light or medium duty vehicle using diesel fuel or a reconstructed motor vehicle with engine years defined in 326 IAC 13-1-1(a)(3)(B) will be issued an exemption sticker by a facility.

(4) Issuance of compliance sticker. A compliance sticker will be issued to motor vehicles that pass the test and to motor vehicles that are granted a waiver in accordance with 326 IAC 13-1-7(e). The compliance sticker will be valid through the end of the month and year as indicated on the sticker.

(5) Issuance of repair sticker. A repair sticker will be issued to motor vehicles failing an initial test. The repair sticker shall be displayed along with an existing sticker and shall validate the existing sticker for one (1) month beyond its expiration date.

(c) The compliance, new vehicle and interim stickers shall indicate the year and the month in which they expire.

(d) Stickers, except exemption and new vehicle stickers issued by the bureau, shall be affixed by a motor vehicle emission inspector. Replacement sticker must be obtained at a facility.

(e) The owner of each motor vehicle subject to 326 IAC 13-1 shall present such motor vehicle for testing at a facility during the month and year indicated on the sticker affixed to the motor vehicle.

(f) Display of sticker. Sticker shall be affixed to the lower left-hand corner of the motor vehicle's front window (as determined from the drivers' seat). Failure to place the sticker on the proper vehicle in the proper location will invalidate the sticker.

326 IAC 13-1-4 Test procedures

Sec. 4. (a) Each motor vehicle shall be presented for testing at a facility with its registration or title which identifies the motor vehicle by make, model year, vehicle identification number and license number.

(b) Each motor vehicle subject to 326 IAC 13-1 shall be tested at a facility in accordance with the following procedures:

(1) The test will be determined by the model year of the vehicle as follows:

(A) For 1981 and newer vehicles the test will be either the two thousand five hundred (2,500) rpm/idle test or the engine restart two thousand five hundred (2,500) rpm/idle test depending on the vehicle make.

(B) For 1980 and older vehicles the test will be the idle test.

(2) All tests will be performed in accordance with 40 CFR 85, Subpart W.

(3) The engine shall be at normal operating temperature and all accessories shall be turned off during the test.

(4) The motor vehicle shall be level during the test.

(5) Motor vehicles with more than one (1) exhaust pipe will be tested by sampling each pipe and averaging the results.

(6) The exhaust sample probe shall be placed at least ten (10) inches into the tail pipe. If such insertion is not possible, an extension shall be placed on the pipe to allow the necessary insertion.

(7) The test shall not be completed if the carbon dioxide concentration in the exhaust is less than five percent (5%). It shall be the owner's responsibility to correct the problem which causes the motor vehicle to be rejected and to return the motor vehicle for a valid test.

(8) If the engine stalls during the test, the test shall be restarted. The test shall not be completed for a motor vehicle that repeatedly stalls during the test. It shall be the owner's responsibility to correct the stalling problem and to return the motor vehicle for a valid test.

(9) Motor vehicles failing the test shall be subjected to a visual tampering inspection before the vehicle leaves the facility. The motor vehicle may be inspected for the presence and good operating condition of emission control devices included in the manufacturer's original design.

* Copies of the Code of Federal Regulations (CFR) may be obtained from the Government Printing Office, Washington, D.C. 20402, or from the Department of Environmental Management, Office of Air Management, 105 South Meridian Street, Indianapolis, Indiana 46225.

326 IAC 13-1-5 Pass-fail limits

Sec. 5. (a) Motor vehicles fail the test if the exhaust emissions are greater than the applicable emission limits based on the model year of the vehicle.

(b) Motor vehicles pass the test if the exhaust emissions are less than or equal to the emission limits based on the model year of the vehicle.

(c) Specifications for test emission limits are set forth in TABLE 1 and TABLE 2 below. The pass-fail determination will be based on emission limits which reflect RACT levels of emission reduction.

TABLE 1

Idle Test Emission Limits

	Vehicle Model Year[1]	Hydrocarbon Concentration (ppm)	Carbon Monoxide Concentration (%)
LIGHT DUTY MOTOR VEHICLES			
	1972-74	500	5.0
	1975-79	350	3.5
	1980	250	2.0
	1981 +	220	1.2
MEDIUM DUTY MOTOR VEHICLES			
	1972	600	6.0
	1973-78	500	5.0
	1979-1983	350	3.5
	1984 +	220	1.2

[1] Except as exempted pursuant to 326 IAC 13-1-1(a).

TABLE 2

2500 RPM Test Emission Limits

	Vehicle Model Year	Hydrocarbon Concentration (ppm)	Carbon Monoxide Concentration (%)
Light Duty Vehicles	1981 +	200	1.0
Medium Duty Vehicles	1984 +	200	1.0

326 IAC 13-1-6 Test reports; repair forms

Sec. 6 (a) Each owner of a motor vehicle tested at a facility will be provided a test report which will include the following information:

(1) the owner's name;

(2) the license plate number;

(3) the type of motor vehicle;

(4) the motor vehicle identification number;

(5) the model year;

(6) the make of motor vehicle;

(7) the type of fuel required for use in the motor vehicle;

(8) the odometer mileage on the motor vehicle;

(9) the emission standards applicable to the motor vehicle;

(10) the emission measurements obtained by the test;

(11) the final test result;

(12) date and time of inspection;

(13) the report serial number;

(14) the sticker serial number;

(15) the facility and lane identification.

(b) For motor vehicles failing the test the vehicle owner shall also receive a repair form.

(c) A completed repair form shall contain the following information:

(1) the exact repairs or adjustments made to the motor vehicle since the initial test;

(2) the itemized cost of repairs or adjustments made;

(3) the location of the repair facility where the repairs or adjustments were made; and

(4) the printed name and signature of the person making the repairs or adjustments.

326 IAC 13-1-7 Test failures and waivers

Sec. 7. (a) Motor vehicles failing an initial test will be issued a repair sticker. Repairs or adjustments necessary to bring a motor vehicle into compliance with the emission limits in 326 IAC 13-1-5 shall be the responsibility of the motor vehicle owner.

(b) A motor vehicle which fails a test shall be returned to a facility for retesting. Each motor vehicle shall be presented for retesting with a completed repair form and a test report.

(c) Motor vehicles failing a retest will not be issued a new repair sticker.

(d) Motor vehicles passing a retest will be issued a compliance sticker. The date on the sticker will be based on the date the initial test was required.

(e) Motor vehicles failing a retest will be granted one of the following types of waivers by the motor vehicle emission inspector:

(1) Forty percent (40%) improvement waiver: providing the motor vehicle shows a forty percent (40%) improvement in emissions when compared to the original test for each pollutant for which the motor vehicle was failed.

(2) Repair and adjustment cost waiver: providing the motor vehicle owner makes emission related repairs or adjustments which cost at least one hundred dollars ($100) if the owner pays for the work performed or at least fifty dollars ($50) for parts if the owner performs his own repairs and the following conditions are met:

(A) all items found in a tampered condition have been replaced and are in good operating condition; and

(B) repairs have been made or parts replaced for the purpose of meeting the emission standards; and

(C) such repairs have been certified by the person making the repairs or installing parts; and

(D) receipts for repairs or parts have been provided; and

(E) a low emission tune-up consisting of the following has been performed:

(i) for motor vehicles failing the HC standard, the following diagnostics, adjustments, and repairs shall be performed, or parts shall be replaced, if they are shown out of adjustment or defective:

(AA) Connect tachometer, and if available, connect engine analyzer oscilloscope and HC/CO Nondispersive Infrared (NDIR) analyzer to warmed up vehicle and record initial emission values.

(BB) Check for faulty spark plugs, and faulty open, crossed, or disconnected spark plug wires, and faulty coil wire. Repair or replace defective components.

(CC) Check PCV valve for correct operation and verify free flow through the PCV system passages and hoses. Repair or replace defective components.

(DD) Check sensors and vacuum hoses for malfunction and repair connection. Repair and replace defective components.

(EE) Check air pump for proper operation. Repair or replace defective components.

(FF) Check dwell (or point gap for new points only) and basic timing according to manufacturer's specifications, and adjust or replace maladjusted or defective components. Check vacuum advance, condenser, coil, and distributor cap, and adjust or replace maladjusted or defective components.

(GG) Check engine cylinder valves for maladjustment, and adjust to manufacturer's specifications.

(HH) For motor vehicles with closed loop feedback systems, adjust to manufacturer's specifications and repair or replace malfunctioning components.

(II) Inspect for dirty or plugged air cleaner and stuck choke, and repair and replace defective components.

(JJ) With air filter installed, adjust idle speed and air/fuel mixture in accordance with the motor vehicle manufacturer's specifications. If an HC/CO NDIR analyzer is available, record final HC/CO emission values of the motor vehicle after it has been warmed up.

(ii) for motor vehicles failing the CO standard, the following diagnostics, adjustments, and repairs shall be performed, or parts shall be replaced, if they are shown out of adjustment or defective:

(AA) Connect tachometer and if available, connect engine analyzer oscilloscope and HC/CO Nondispersive Infrared (NDIR) analyzer to warmed up motor vehicle and record initial emission values.

(BB) For motor vehicles with closed loop feedback systems, adjust to manufacturer's specifications and repair or replace malfunctioning components.

(CC) Inspect for dirty or plugged air cleaner and stuck choke, and repair and replace defective components.

(DD) Check carburetor for float setting, power valve, needles, seats and jets, and repair or replace defective components. Carburetor replacement is not required.

(EE) With air filter installed, adjust idle speed and air/fuel mixture in accordance with the motor vehicle manufacturer's specifications. If an HC/CO NDIR analyzer is available, record final HC/CO emission values of the motor vehicle after it has been warmed up.

(iii) for motor vehicles failing HC and CO standards, the diagnostics, adjustments, repairs, and parts replacement required in items (i) and (ii), above shall be performed; and

(F) a motor vehicle emission inspector shall lift the motor vehicle's hood and make a visual inspection to determine if the repairs certified on the repair form have actually been performed. If the certified repairs have not been made, the certificate of waiver shall be withheld.

(G) After the waiver requirements in subsection (e)(2) of this section have been performed the vehicle owner may:

(i) return the motor vehicle to the facility at a time when the department representative is present, at which time the representative will review the test results and repair form and make a visual underhood examination. The representative may grant or deny the waiver based on such examination.

(ii) be issued a waiver by Ivy Tech personnel whom are designated by the department.

(f) A motor vehicle not qualifying for a waiver at the time of the retest shall qualify for a waiver on subsequent retests provided the conditions of this section are met.

326 IAC 13-1-8 Facility and testing requirements

Sec. 8 (a) Facilities shall be established and operated by Ivy Tech. The department shall monitor Ivy Tech's operations in accordance with the provisions of the agreement between the state of Indiana and Ivy Tech.

(b) The number of facilities shall be set forth in the agreement between the department and Ivy Tech, and facilities shall be located to maximize public convenience and minimize the average distance traveled by motor vehicle owners to present motor vehicles for testing.

(c) Motor vehicle emission inspectors and other facility personnel shall be employed by Ivy Tech and all tests shall be performed or supervised by a motor vehicle emission inspector meeting the requirements of 326 IAC 13-1-7.

(d) Ivy Tech shall collect data and maintain records of tests and facility operations as required by the department.

(e) Ivy Tech shall issue test reports, stickers, and repair forms in accordance with the provisions of 326 IAC 13-1.

(f) Ivy Tech or any person employed by Ivy Tech for a facility operation shall not engage in or have an economic interest in the operation of repair shops located in the state; perform emission related repairs for compensation; or recommend repair shops to owners or operators of motor vehicles being inspected.

(g) Except as provided in 326 IAC 13-1-4(b)(1) and 326 IAC 13-1-7(e)(2)(F) the motor vehicle emission inspector or other motor vehicle inspection facility personnel shall not lift the hood of any motor vehicle without the express consent of the owner or operator.

326 IAC 13-1-9 Motor vehicle emission inspectors; certification

Sec. 9. (a) All tests required by this rule (326 IAC 13-1) shall be performed by a motor vehicle emission inspector certified by the department as meeting the qualifications of this section.

(b) To become certified, a person shall submit an application in a form approved by the department accompanied by evidence that the applicant has satisfactorily completed an approved course of training in inspection procedures and emission testing equipment within the twelve (12) month period preceding the date of application. Ivy Tech, in cooperation with the department, shall develop a training course for this purpose and make the course available to all applicants.

(c) A certificate issued under this section shall be issued free of charge and shall expire two (2) years after the date of issuance. The certificate may be renewed without charge upon application and accompanied by evidence that the applicant has satisfactorily completed an approved retraining course in motor vehicle emission inspection procedures and emission test equipment.

326 IAC 13-1-10 Facility quality assurance program

Sec. 10. (a) The department will check the calibration, maintenance, and operation of exhaust analyzers, test procedures and records at each facility. Calibration, maintenance, operation and adjustment of exhaust gas analyzers shall be performed in accordance with 40 CFP 85, Subpart W.

* Copies of the Code of Federal Regulations (CFR) may be obtained from the Government Printing Office, Washington, D.C. 20402, or from the Department of Environmental Management, Office of Air Management, 105 South Meridian Street, Indianapolis, Indiana 46225.

(b) No emission tests shall be conducted with any analyzer that is not operating within all specifications developed or approved by the department.

(c) Motor vehicle test reports and fiscal reports submitted by facility operators shall be checked for completeness and accuracy. The department shall have the right to audit contractor's and subcontractor's records.

326 IAC 13-1-11 Fleet inspection procedures

Sec. 11. (a) Ivy Tech shall, at the request of the owner or operator of a fleet of twenty-five (25) or more motor vehicles which are subject to this rule (326 IAC 13-1), make special arrangements for the testing of such a fleet. Such arrangements shall consist of but are not limited to the following:

(1) Ivy Tech may set aside a test lane or lanes at certain times for use by the fleet owner exclusively to minimize waiting time. Such test lane or lanes may be at the facility, or the fleet owner or operator's site of operation. Such time may be during the time in which the facility is normally closed.

(2) Fleet owners may utilize their own emission analyzers to perform tests on their own motor vehicles provided the emission analyzers meet specifications established by the department. This arrangement shall be subject to the following conditions:

(A) The fleet owner shall maintain a repair facility capable of making emission related adjustments and repairs.

(B) The fleet owner shall employ one (1) or more motor vehicle emission inspectors certified in accordance with 326 IAC 13-1-9 who shall conduct all emission tests.

(C) The fleet owner shall keep records of all tests, repairs performed, and retests. Such records shall be kept in accordance with 326 IAC 13-1-6 and shall be submitted to the department on a monthly basis.

(D) Fleet owners shall obtain emission stickers from Ivy Tech and receive no more stickers than the number of motor vehicles in the fleet. The fleet owner shall be held accountable for stickers issued.

(E) Certified motor vehicle emission inspectors employed by fleet owners may issue test reports and affix compliance stickers, if:

(i) the motor vehicle complies with the requirements of this rule (326 IAC 13-1); and

(ii) it is part of the fleet for which approval has been granted by the department.

(F) A department representative shall investigate the operation of fleet tests, check the calibration and maintenance of exhaust analyzers, test procedures and records as the conditions and circumstances indicate. Fleet motor vehicles may be required to be retested at a facility. Failure to comply with any requirements stated in 326 IAC 13-1 or any conditions specified by the department shall be cause for revocation of such approval.

Rule 2. Motor Vehicle Tampering and Fuel Switching

326 IAC 13-2-1 Applicability

Sec. 1. This rule (326 IAC 13-2) shall apply to the following:

(1) all persons as defined in 326 IAC 13-2-2;

(2) all service stations;

(3) all gasoline dispensing facilities;

(4) all gasoline powered motor vehicles with a model year of 1975 and later, including but not limited to passenger cars, trucks and vans, required to be registered by the bureau of motor vehicles in the state of Indiana;

(5) all gasoline powered motor vehicles with a model year of 1975 and later, owned or operated by government agencies.

326 IAC 13-2-2 Definitions

Sec. 2. The following terms used in this rule (326 IAC 13-2) shall be defined as follows:

"Emission control system or element of design" means any emission control device installed by the manufacturer to reduce air pollution from a motor vehicle including but not limited to the following:

(1) Positive crankcase ventilation (PCV) system.

(2) Air pump.

(3) Catalyst and catalytic convertor.

(4) Evaporative canister.

(5) Exhaust gas recirculation (EGR) system.

(6) Leaded fuel nozzle restrictor installed on motor vehicles designed to use unleaded gasoline only.

"Leaded gasoline" means gasoline containing greater than 0.05 grams of lead per gallon of gasoline.

"Person" means every individual, firm, partnership, association, corporation, fleet operator, or any governmental agency.

"Service station" means every garage, muffler shop or car dealer where motor vehicles are repaired or serviced.

"Tampering" means to remove or render inoperative or cause to be removed, or to make less operative any of the emission control devices specified in the definition of emission control system.

"Unleaded gasoline" means gasoline containing not more than 0.05 grams of lead per gallon of gasoline.

326 IAC 13–2–3 Prohibitions

Sec. 3. (a) Tampering of pollution control device on motor vehicles:

(1) No person shall rent, lease, offer for sale, or in any manner transfer ownership of a motor vehicle with knowledge that the vehicle has been subject to tampering.

(2) No person shall cause, suffer, allow or permit the removal, dismantling, disconnection, disabling, or disrepair of any emission control system which has been installed on a motor vehicle by the manufacturer.

(3) No person shall offer for sale, or advertise for sale in Indiana any add–on part or modified part, such as, catalyst test pipe, which inhibits the effectiveness or bypasses an emission control system.

(4) No person shall operate a motor vehicle within the state of Indiana with knowledge that the vehicle has been subject to tampering.

(b) Fuel Switching: (1) No person shall sell, dispense, or offer for sale gasoline represented to be unleaded unless such gasoline meets the defined requirements for unleaded gasoline.

(2) No person shall knowingly introduce, or cause or allow the introduction of leaded (regular) gasoline into a motor vehicle which was originally designed to use unleaded gasoline only.

(3) No person shall modify the gasoline pump dispensing nozzle in order to dispense leaded gasoline into a motor vehicle which was originally designed to use unleaded gasoline only. Each leaded gasoline pump shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 0.93 inches. Each unleaded gasoline pump shall be equipped with a nozzle spout having a terminal end with an outside diameter not greater than 0.84 inches and the spout length from retaining sprint to the tip shall be a minimum of 2.75 inches.

(4) All gasoline dispensing facilities shall display permanent signs clearly distinguishing unleaded and leaded gasoline dispensing pumps.

(5) Each gasoline dispensing facility shall display permanent signs visible to any person introducing gasoline in a motor vehicle. The sign shall state that federal and state law prohibits the introduction of any gasoline containing lead into any motor vehicle designed by the manufacturer for unleaded gasoline only. This notice shall be no smaller than 36–point bold type.

326 IAC 13–2–4 Penalties

Sec. 4. (a) Violation of 326 IAC 13-2-3(a)(1), (2), or (4) subjects the owner or operator to suspension or cancellation of the registration for the vehicle by the bureau of motor vehicles. The vehicle is not thereafter eligible for registration until the violating device has been restored, replaced, or repaired.

(b) Any person found to be in violation of 326 IAC 13-2-3(a) shall be subject to civil penalty of not more than two thousand five hundred dollars ($2,500) per violation.

(c) Any person found to be in violation of 326 IAC 13-2-3(b) shall be subject to civil penalty of not more than ten thousand dollars ($10,000) per violation

ARTICLE 14. EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Rule 1. General Provisions

326 IAC 14–1–1 Applicability

Sec. 1. (a) The provisions of 326 IAC 14 apply to the owner or operator of any stationary source for which a standard is prescribed under this article (326 IAC 14.)

(b) The board adopts by reference and incorporates 40 CFR 61 Subpart A, "General Provisions" concerning emission standards for hazardous air pollutants, with the exception of the following sections:

61.04 — Address

61.11(f) — Administrator's Authority on Waiver of Compliance

61.12(d) — Alternative Means of Emission Limitation

61.16 — Availability of Information

61.17 — State Authority

and as modified in 326 IAC 14-1-2. Provisions of waiver of compliance in 40 CFR 61 Section 61.11, Subpart A, shall not apply to sources subject to the requirements established in 326 IAC 14-9.

326 IAC 14–1–2 Definitions

Sec. 2. (a) For the purposes of this article (326 IAC 14), the definitions, abbreviations and units listed in 40 CFR 61, Subpart A, Section 61.02 and 61.03 shall apply with the exception of subsection (b) of this section.

(b) For the purposes of this article (326 IAC 14), the following substitutions shall be made for terms used in the portions of 40 CFR Part 61 adopted by reference:

(1) "Administrator" means the commissioner of the department of environmental management.

(2) "U.S. Environmental Protection Agency" or "U.S. EPA" means the department of environmental management.

326 IAC 14–1–3 More stringent limitations apply

Sec. 3. If emission limitations contained in this article (326 IAC 14) conflict with or are inconsistent with any other emission limitations established by title 326, then the more stringent limit shall apply.

326 IAC 14–1–4 Federal regulations

Sec. 4. Copies of the Code of Federal Regulations (CFR) referenced in this article (326 IAC 14) may be obtained from the Government Printing Office, Washington, D.C. 20402. Copies of the said material are also available from the Indiana Department of Environmental Management, Office of Air Management, 105 South Meridian Street, Indianapolis, Indiana 46225. All citations to the CFR in this article (326 IAC 14) refer to the version cited in 326 IAC 1-1-3.

Rule 2. Emission Standard for Asbestos

326 IAC 14–2–1 Applicability; incorporation by reference of federal standards

Sec. 1. (a) The provisions of this rule (326 IAC 14–2) shall apply to the following sources:

(1) Asbestos mills.

(2) Surfacing of roadways with asbestos containing materials.

(3) Manufacturing and fabricating operations using commercial asbestos.

(4) Demolition and renovation of institutional, commercial, or industrial building, structure, facility, installation, or portions thereof, which contains asbestos bearing materials.

(5) Spray-on application of materials containing asbestos.

(b) The board hereby adopts by reference and incorporates herein 40 CFR 61, Subpart M, Emission Standard for Asbestos.

KENTUCKY

should be responded to, including human exposure to the asbestos while the friable ACM remains in the school building, and the ability of the LEA to continue to provide educational services to the community; or

(d) Does not provide response actions which adequately protect human health or the environment from friable ACBM.

(2) The cabinet shall deny a management plan if the cabinet determines that the LEA willfully made any misstatements in the plan, or the LEA cannot reasonably be expected to fulfill the obligations of the plan.

(3) If the cabinet disapproves a plan, the cabinet shall explain in writing to the LEA the reasons why the plan was disapproved and the changes that shall be made in the plan. Within thirty (30) days after the date on which notice of the plan's disapproval is received, the LEA shall revise the plan to conform with the suggested changes. The cabinet may extend the thirty (30) day period for not more than ninety (90) days.

Section 7. Notification. As required in 40 CFR 763.93 the management plan shall contain the dates when each response action will begin and end. If the schedule is amended, the LEA shall notify the cabinet of any response action which will occur and which must be performed by an accredited individual, at least ten (10) days prior to commencement, unless the response action is an emergency response action that must be performed by an accredited individual. The LEA shall notify the cabinet of these emergency response actions as soon as possible, as determined by the cabinet, prior to commencing the emergency response action. If the notification is not in writing, then written confirmation of the response action shall also be provided as soon as possible, as determined by the cabinet.

Section 8. Fees. Fees required in this section shall be submitted to the cabinet by check or money order, payable to the Kentucky State Treasurer.

(1) The fee for review of each management plan or deferred management plan shall be sixty (60) dollars for each school building that is identified in the plan as containing ACM and thirty (30) dollars for each school building that is identified in the plan as not containing ACM.

(2) The fee for review of a revision to the management plan shall be thirty (30) dollars for each building contained in the revision and in the original management plan, for which a new response action is proposed. For each new building contained in the revision, the fee shall be sixty (60) dollars if the building contains ACM, and thirty (30) dollars if it does not contain ACM.

Section 9. Penalties. Any LEA which violates any provision of this regulation shall be subject to the appropriate enforcement action as provided under KRS 224.994.

CHAPTER 65

MOBILE SOURCE RELATED EMISSIONS

401 KAR 65:005. Liquefied petroleum gas carburetion systems.

Section 1. General Provisions. (1) Applicability. This regulation is applicable only to motor vehicles utilizing liquefied petroleum gas for fuel which are required to be equipped with carburetion systems approved by the department in order to be eligible for tax exemptions as set forth in KRS 234.321.

(2) Definitions. As used in this regulation, all terms not defined herein shall have the meaning given them in 401 KAR 50:010.

(a) "Exhaust emissions" means substances emitted to the atmosphere from any opening downstream from the exhaust port of a motor vehicle engine.

(b) "Light-duty vehicle" means any motor vehicle either designed primarily for transportation of property and rated at 6,000 pounds gross vehicle weight or less or designed primarily for transportation of persons and having a capacity of twelve (12) persons or less.

(c) "Heavy-duty vehicle" means any motor vehicle either designed primarily for transportation of property and rated at more than 6,000 pounds gross vehicle weight or designed primarily for transportation of persons and having a capacity of more than twelve (12) persons.

(d) "Gross vehicle weight" means the manufacturer's gross weight rating.

(3) Vehicle modification to use liquefied petroleum gas:

(a) In addition to all other standards or requirements imposed, any modification of a motor vehicle which allows that vehicle to use liquefied petroleum gas (LPG) for fuel shall not in its operation and function, or malfunction:

1. Cause any emission into the ambient air of any noxious or toxic matter that would not be emitted in the operation of such motor vehicle or motor vehicle engine operating without such a modification; or

2. Cause any unsafe condition which may endanger the motor vehicle, or its occupants or other persons or property.

(b) In cases where a modification of a vehicle has been made which enables gasoline and/or liquefied petroleum gas to be used as fuel, evidence satisfactory to the department must be presented to the department that the modification will not cause increased emissions by the vehicle when that vehicle is being fueled by gasoline.

(c) The reactivity of the exhaust gases must not be increased by any modification to a carburetion system, which modification allows the use of liquefied petroleum gas as a fuel.

(4) Application for approval:

(a) An application for approval of any carburetion system which uses liquefied petroleum gas may be made to the department by any manufacturer.

(b) The application shall be in writing, signed by an authorized representative of the manufacturer, and shall include the following:

1. Identification and description of the carburetion systems, vehicles and engines with respect to which approval is required.

2. A complete description of all modifications and additions to the engine or vehicle.

3. Emission data on such vehicles and engines tested in accordance with the applicable exhaust emission test procedures.

4. A description of tests performed to ascertain compliance with the general standards, and the result of such test.

5. A statement listing the name and location of the testing facility, its qualifications to perform such tests, a certification that such testing was at the time the test was performed, approved to conduct such tests by the U.S. Environmental Protection Agency.

6. A statement of recommended maintenance procedures and equipment necessary to assure that the carburetion system,

vehicle and engine in operation conform to the requirements of this regulation, and a description of the program for training of personnel for such maintenance.

7. An agreement that any modifications made to the system in the field will be properly identified and reported to the department. To meet this requirement, the model number shall be permanently marked on the carburetor. An adhesive label listing the information in subparagraphs 8. to 12. of this paragraph shall be furnished for installation on the air cleaner.

8. Manufacturer's name and address.

9. Accepted by the Department for Natural Resources and Environmental Protection for use on engine sizes .... cubic inch to .... cubic inch.

10. Spark timing.

11. Idle speed.

12. Mixture adjustment (if used).

(c) If, after a review of the data submitted by the manufacturer, the department determines that a carburetion system to use liquefied petroleum gas conforms to this regulation, it will issue an approval with respect to such system.

Section 2. Standards for Exhaust Emissions. The applicable exhaust emission standards for liquefied petroleum gas carburetion systems are as follows:

(1) Light-duty vehicles.

(a) Hydrocarbons emissions shall not exceed 0.41 grams per vehicle mile.

(b) Carbon monoxide emissions shall not exceed 3.4 grams per vehicle mile.

(c) Oxides of nitrogen emissions shall not exceed 0.4 grams per vehicle mile.

(2) Heavy-duty vehicles.

(a) Hydrocarbons plus oxides of nitrogen (as NO_2) emissions shall not exceed sixteen (16) grams per brake horsepower hour.

(b) Carbon monoxide emissions shall not exceed forty (40) grams per brake horsepower hour.

Section 3. Test Procedures for Vehicle and Engine Exhaust Emissions. (1) The department will approve carburetion systems which a manufacturer has successfully tested at a facility which is determined to be qualified for performing such testing by the U.S. Environmental Protection Agency. All testing procedures shall be conducted in accordance with the procedures established by the department.

(2) At least one (1) vehicle in each engine displacement class for which the exemption is sought must be tested for emission data. Each manufacturer, however, must accumulate data on a minimum of two (2) vehicles for each carburetor model to qualify for approval.

Displacement Classes

Class	Engine Displacement
A	Under 140 Cubic Inches
B	140–200 Cubic Inches
C	200–250 Cubic Inches
D	250–300 Cubic Inches
E	300–375 Cubic Inches
F	Over 375 Cubic Inches

(3) Carburetion systems shall be installed in accordance with manufacturer's specifications and instructions in order to qualify for the exemption.

MARYLAND

MARYLAND MOTOR VEHICLE EMISSIONS ACT

(Maryland Transportation Code, Title 23, Vehicle Laws — Inspection of Used Vehicles and Warnings for Defective Equipment, Subtitle 2 — Motor Vehicle Emissions Inspection; Enacted by Maryland Laws of 1979, Chapter 421; Amended by Laws of 1980, Ch. 725; Laws of 1981, Ch. 38; Laws of 1982, Chs. 492, 770; Laws of 1983, Chs. 311, 312, 323, 517, 549; Laws of 1985, Ch. 19; Laws of 1987, Ch. 306; Laws of 1988, Ch. 108)

Administering Agency: **Department of Transportation
Motor Vehicle Administration
6601 Ritchie Highway
Glen Burnie, Maryland 21062**

23-201. Definitions.

(a) *In general.* — In this subtitle, the following words have the meanings indicated.

(b) *Emissions control program* — "Emissions control program" means the program requiring and implementing the exhaust emissions test and the emissions equipment and misfueling inspection.

(c) *Emissions equipment* — "Emissions equipment" means any emissions control device that has been installed on a motor vehicle by a manufacturer of motor vehicles.

(d) *Emissions equipment and misfueling inspection* — "Emissions equipment and misfueling inspection" means an inspection to verify the presence of required emissions equipment and an inspection to determine that the vehicle has not been misfueled.

(e) *Emissions standard.* — (1) "Emissions standard" means a requirement that limits the quantity, quality, rate, or concentration of emissions from a motor vehicle.

(2) "Emission standard" includes a requirement that relates to the operation or maintenance of a motor vehicle to assure continuous emission reduction.

(f) *Engine tune-up.* — "Engine tune-up" means the performance of the following procedures on a motor vehicle:

(1) Inspection of the air cleaner and choke, and the cleaning, repairing, or replacing of the air cleaner or choke as required;

(2) Adjustment of the idle speed and air-fuel mixture according to the manufacturer's specifications;

(3) Adjustment of the ignition dwell or gap and ignition timing according to manufacturer's specifications;

(4) Inspection of the positive crankcase ventilation valve and vacuum hoses and the repair and replacement of those parts as may be required; and

(5) Inspection of the spark plugs and spark plug wires and the repair and replacement of those parts as may be required.

(g) *Exhaust emissions test* — "Exhaust emissions test" means the sampling and measurement of certain components of motor vehicle exhaust to determine whether the motor vehicle is in compliance with an emissions standard.

(h) *Misfueling* — "Misfueling" means the introduction of leaded fuel into a motor vehicle designed by the motor vehicle manufacturer to use unleaded fuel.

(i) *Secretary* — "Secretary" means the Secretary of Environment.

23-202. Rules and regulations for establishment of inspection program; establishment of inspection system; location of inspection facilities; contents of rules and regulations; final request for bids.

(a) (1) The Administration and the Secretary shall establish an emissions control program in the metropolitan Baltimore intrastate air quality control region and in the Maryland portion of the national capital interstate air quality control region as designated in 40 CFR part 81, unless otherwise required by federal law.

(2) The program shall remain in effect as long as required by federal law.

(b) The emissions program shall provide for:

(1) during the period on or before December 31, 1988 an annual exhaust emissions test; and

(2) During the period after December 31, 1988, a biennial exhaust emissions test and emissions equipment and misfueling inspection.

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(c) By rules and regulations, the Administration and the Secretary:

(1) Shall grant a waiver to a vehicle owner if:

(i) The vehicle fails to pass the exhaust emissions test;

(ii) The vehicle owner exhibits evidence acceptable to the Administration that the vehicle has either had an engine tune-up or that the owner has actually expended $75 towards an engine tune-up to the vehicle within 30 days after the emissions test; and

(iii) The vehicle fails a retest, except that if the vehicle owner has exhibited evidence acceptable to the Administration that the vehicle owner actually expended $75 for the engine tune-up to the vehicle within 30 days before the initial exhaust emissions test, a retest is not required;

(2) Notwithstanding the provisions of this section, may not grant a waiver if it is found in the testing process that a factory installed emissions device has been tampered with or removed, or that the vehicle has been misfueled;

(3) May grant additional waivers to extend the time for compliance in cases of financial hardship or for unusual circumstances;

(4) Shall establish criteria to certify repair facilities for the purpose of bringing vehicles into compliance with the applicable emissions standards;

(5) May provide for the suspension, revocation, or denial of renewal of the certification of a repair facility upon evidence that vehicles repaired by that facility for the purpose of bringing them into compliance with the applicable emission standards have repeatedly failed tests or retests and the Administration and the Secretary have clear and convincing evidence the repair facility is not meeting satisfactory performance standards;

(6) Shall define the inspection parameters for the emissions equipment and misfueling inspection;

(7) Shall adopt a schedule for the exhaust emissions test;

(8) shall adopt a schedule for the emissions equipment and misfueling inspections; and

(9) Shall establish under title 2 of the Environment Article, emission standards to be used for the exhaust emissions testing and emissions equipment and misfueling testing of motor vehicles under this subtitle.

23–203. Installation and operation of system or facility by independent contractor; minimization of nonrecoverable expenses.

(a) (1) By rules and regulations, the Administration and the Secretary shall provide for the establishment of facilities to conduct any tests or inspections required to be performed on an annual or biennial basis.

(2) If the Administration and the Secretary determine that the system can be installed and operated more effectively and economically by an independent contractor than if installed and operated by the Administration and the Secretary, the Administration and the Secretary may award the installation and operation of the inspection facilities to an independent contractor selected in accordance with the bidding procedures established by the laws of this State.

(b) If the program is awarded to an independent contractor, the facilities shall be provided, equipped, and maintained by the independent contractor, and the operating personnel of the facilities shall be employees of the contractor, and not of the State, and the contractor may not perform engine tune-ups as defined in section 23–201.

(c) The President of the Senate and the Speaker of the House of Delegates shall appoint a special committee composed of 3 Senators and 3 Delegates who shall regularly consult with the Secretary of Transportation and the Secretary of the Environment on the administration of the program and any contract in accordance with the terms of these provisions.

23–204. Inspections to be conducted by facilities.

The facilities established under §23-203 of this subtitle shall conduct the annual exhaust emissions test or the biennial exhaust emissions test and emissions equipment and misfueling inspections of motor vehicles to determine whether each vehicle complies with emission standards established under this subtitle for that vehicle.

23–205. Inspection fees.

(a) The Administration and the Secretary shall set the fee to be charged for each vehicle to be inspected and tested by a facility.

(b) The fee shall be collected in a manner established by the Administration and the Secretary.

(c) A specific portion of the fee shall be paid to or retained by the Administration to cover the cost of Administration and Enforcement of the Vehicle Emissions Inspection Program, as provided in the contract between the contractor and the State.

[*Editor's note:* Section 2 of Chapter 108 (1988 Laws) provides:

"Section 2, and be it further enacted, that the Department of Transportation shall study the feasibility of assessing a vehicle emissions control surcharge for all vehicles registered in the State, including the feasibility of prorating the fee in proportion to a county or region's contribution to the State's nonattainment of the federal air quality standards for ozone and carbon monoxide. The Department shall report the findings of this study to the General Assembly by December 1, 1990."]

23-206. Duty to have vehicle inspected; vehicles to meet standards and requirements.

(a) An owner of a motor vehicle that is registered in this State shall have the vehicle inspected and tested as required under this subtitle.

(b) A motor vehicle registered in this State, unless exempted or given a waiver under this subtitle, shall meet the standards and requirements of this subtitle.

(c) Notwithstanding any rule or registration to the contrary, the owner of any gasoline powered motor vehicle registered under §13-916 of this article, with a maximum gross weight up to and including 26,000 pounds, shall have the vehicle inspected and tested as required under this subtitle.

23-206.1 Exemption of ambulances.

Notwithstanding any rule or regulation to the contrary, any fire or rescue apparatus or ambulances owned or leased by a political subdivision of the State, or by a volunteer fire company, rescue squad, or volunteer ambulance company, that is registered as an emergency vehicle as defined in §11-118 of the Transportation Article, is exempt from mandatory inspections under this subtitle.

23-207. Rules and regulations for implementation, administration and enforcement of subtitle; rules and regulations establishing emission standards; required progress reports.

(a) The Administration and the Secretary may jointly adopt rules and regulations as required for purposes of implementation, administration, regulation, and enforcement of the provisions of this subtitle, including rules and regulations that, consistent with federal law, exempt certain vehicles from the inspections and tests under this subtitle.

(b) The Secretary of Transportation and the Secretary of the Environment shall furnish a joint report, within 30 days from the date Congress modified the provisions of the Clean Air Act, to the Legislative Policy Committee, the Senate Judicial Proceedings Committee, and the House Environmental Matters Committee outlining the status of changes in the Federal Clean Air Act as of that date and all other related and pertinent information.

23-208. Termination of program.

Any program adopted under this subtitle terminates on December 31, 1991, unless, prior to its termination, the period of operation is extended by an Act of the General Assembly.

23-209. Fraud.

A person may not commit any fraud or make any misrepresentation in applying for, or preparing documentation relating to this subtitle.

MICHIGAN

MICHIGAN MOTOR VEHICLE EMISSIONS INSPECTION ACT

(Michigan Compiled Laws Annotated, Chapter 257 — Motor Vehicles, Sections 257.1051 — 257.1074, Vehicle Emissions Inspection and Maintenance Act; Enacted by Public Acts of 1980, No. 83)

Administering Agency: **Bureau of Automotive Regulation**
208 North Capitol Street
Lansing, Michigan 48918

§257.1051

Sec. 1. This act shall be known and may be cited as the "vehicle emissions inspection and maintenance act".

§257.1052

Sec. 2. For purposes of this act, the words and phrases defined in sections 3 to 5 have the meanings ascribed to them in those sections.

§257.1053

Sec. 3. (1) "Affected area" means a specified geographic place that contains a major urban area of adjacent communities having a high degree of economic and social integration, which urban area has a population of 200,000 or more, and where the department of natural resources has determined pursuant to the clean air act, 42 U.S.C. 7401 to 7626, that the national ambient air quality standards for ozone or carbon monoxide will not be attained or have not been attained by December 31, 1982.

(2) "Certificate of compliance" means a document that is issued to the owner of a motor vehicle upon passing an inspection or reinspection and is evidence that the motor vehicle inspected or reinspected met the vehicle emission standards provided for under this act.

(3) "Consumer protection" means protecting the public from unfair or deceptive practices.

(4) "Contractor" means a person who is under contract with this state to provide emission inspection services.

(5) "Cut point" means the level of pollutants that are emitted, which level aids in determining whether a particular make and model of motor vehicle passes or fails an inspection.

(6) "Department" means the department of state.

§257.1054

Sec. 4. (1) "Emission control device" means a catalytic converter, thermal reactor, or other component part prescribed by regulations promulgated by the federal environmental protection agency under section 207 of the clean air act, 42 U.S.C. 7541.

(2) "Fleet" means 10 or more motor vehicles owned or leased by 1 person.

(3) "Inspection" means checking and testing a motor vehicle for compliance with a cut point and other requirements prescribed by the rules promulgated under this act.

(4) "Low emission tune-up" means only those repairs which will reduce motor vehicle emissions and may include any or all of the following procedures to be prescribed by rules promulgated by the department pursuant to this act:

(a) Checking and setting to manufacturer's specifications idle mixture, idle speed, ignition timing and dwell.

(b) Checking for connection of vacuum lines and electrical wires.

(c) Checking and replacement of air filter, crankcase ventilation system, spark plugs, and spark plug wires.

(5) "Motor vehicle" means a self-propelled vehicle as defined in section 79 of Act No. 300 of the Public Acts of 1949, as amended, being section 257.79 of the Michigan Compiled Laws, of less than 8,500 pounds gross vehicle weight which is required to be registered for use upon the public streets and highways of this state under Act No. 300 of the Public Acts of 149, as amended, being sections 257.1 to 257.923 of the Michigan Compiled Laws. For purposes of this act motor vehicle includes those vehicles owned by the government of the United States.

(6) "National ambient air quality standards" means the air quality standards for outside air as established in the clean air act, 42 U.S.C. 7401 to 7626.

§257.1055

Sec. 5. (1) "Person" means an individual, corporation, association, partnership, sole proprietorship, or other legal entity; this state; a city, village, township, or county; an agency, department, or instrumentality of the federal government; or an employee, officer, or agent of any of the above.

(2) "Pollutants" means motor vehicle

emitted carbon monoxide and hydrocarbons.

(3) "Tamper with" means to remove or render inoperative, or cause to be removed or rendered inoperative, or to make less operative, an emission control device, or an element of an emission control device that is required by federal law to be installed on or in a motor vehicle.

(4) "Testing station" means a facility that is authorized under this act to conduct inspections and reinspections.

(5) "Waiver" means a legal instrument that relinquishes this state's authority to deny the registration of a motor vehicle pursuant to this act and the rules promulgated under this act.

§257.1056

Sec. 6. (1) The department of natural resources shall promulgate rules pursuant to Act No. 306 of the Public Acts of 1969, as amended, being sections 24.201 to 24.315 of the Michigan Compiled Laws, regarding the determination of an affected area. If a portion of the population of a county is used in making the calculation of an urban area which has a population of 200,000 or more for purposes of determining an affected area pursuant to this act and the rules promulgated under this section, the department of natural resources shall include that entire county in the affected area.

(2) The department of natural resources shall notify the department if the department of natural resources determines that a specified county is in an affected area. The department of natural resources shall consult with the local lead planning agency of the affected area, as designated by the governor of this state pursuant to Executive Directive No. 1973-1, in making this determination.

(3) As soon as possible after the department is notified by the department of natural resources of the circumstance stated in subsection (2), mandatory annual inspections and repairs necessary to reduce motor vehicle emissions in an affected area shall be conducted under this act and the rules promulgated under this act.

§257.1057

Sec. 7. (1) The department with the concurrence of the state transportation department shall submit rules to the joint committee on administrative rules not later than January 1, 1981. The rules submitted to the joint committee on administrative rules shall be promulgated pursuant to Act No. 306 of the Public Acts of 1969, as amended, and do all of the following:

(a) Establish vehicle cut points that are no more stringent than the cut points prescribed by regulations promulgated by the federal environment protection agency under section 207 of the clean air act, 42 U.S.C. 7541, and are effective by December 31, 1982.

(b) Prescribe an emissions test in accordance with regulations promulgated by the federal environment protection agency under section 207(b) of the clean air act, 42 U.S.C. 7541.

(c) Subject to section 22, determine the persons who are to perform the inspections.

(d) Prescribe the motor vehicles that are subject to this act and the rules promulgated under this act.

(e) Prescribe the requirements of the registration or the transfer of registration of a motor vehicle that is required to be inspected under this act or the rules promulgated under this act.

(f) Prescribe the requirements and procedures for issuing a waiver or certificate of compliance. The procedures shall provide for the granting of waivers based on an evaluation of receipts for repairs performed on the motor vehicle within 90 days of inspection or reinspection.

(g) Define the procedures and adjustments necessary for a low emission tune-up.

(h) Establish and provide for the operation of a mechanic training program designed to provide the training required to properly make the repairs necessary to reduce motor vehicle emissions.

(i) Unless the legislature shall provide by law for a state income tax credit for persons paying the inspection fee, establish inspection fees, of not more than the maximum per vehicle established by section 21, to be paid by a motor vehicle owner.

(j) Prescribe the terms of an exemption for certain motor vehicle owners which will insure compliance with the federal statutory and regulatory ambient air quality standards while not exempting motor vehicle owners whose income exceeds the income eligiblity maximum for medicaid.

(2) In promulgating the rules pursuant to this section regarding who will perform the inspections, the department and the state transportation department shall enhance to the extent possible the interest of the consumer in all of the following:

(a) Consumer cost and the cost of the program under this act.

(b) Consumer convenience.

(c) Consumer choice.

(d) Consumer protection.

(3) The rules promulgated pursuant to this section regarding the tests to be performed for the purposes of inspections under this act shall prescribe tests that are in compliance with the clean air act, 42 U.S.C. 7401 to 7626, and the federal regulations for a performance warranty test established pursuant to section 207(b) of the clean air act, 42 U.S.C. 7541(b).

(4) The department and the state transportation department in promulgating rules pursuant to this section shall consider and may promulgate rules regarding the granting of an extension of time in which repairs under this act may be made based on financial hardship as determined by the department and the state transportation department.

§257.1058

Sec. 8. If the rules promulgated pursuant to section 7 provide for any inspections under this act to be performed by contractors, and for purposes of inspections performed pursuant to section 22 by a fleet inspection station, the department with the concurrence of the state transportation department shall promulgate rules regarding the contractors and fleet testing stations performing the inspections considered necessary by the department and the state transportation department to implement and enforce this act and meet the requirements of section 22, including all of the following:

(a) The provisions of a contract with the contractor.

(b) The issuance, revocation, or suspension of a permit for a fleet testing station.

(c) The determination of which agency or department shall administer the rules promulgated pursuant to this subsection.

§257.1059

Sec. 9. (1) If the rules promulgated pursuant to section 7 provide for any inspections under this act to be performed by a motor vehicle repair facility that is registered pursuant to Act No. 300 of the

Public Acts of 1974, as amended, being sections 257.1301 to 257.1340 of the Michigan Compiled Laws, the department shall promulgate rules pursuant to Act No. 306 of the Public Acts of 1969, as amended, regarding the inspections to be performed by a registered motor vehicle repair facility. The rules promulgated by the department pursuant to this section shall include all of the following:

(a) Criteria for determining the eligibility of an applicant for a license to perform inspections under this act including but not limited to the adequacy of the facility, availability of the required testing equipment, and the competence of the personnel who will perform the tests for an inspection.

(b) The fee for an original license shall not exceed $50.00.

(c) The term of a license.

(d) Procedures for the operation of an inspection facility licensed pursuant to the rules promulgated under this section.

(e) Providing for adequate consumer protection.

(2) A testing station shall not perform inspections under this act unless the testing station is licensed pursuant to the rules promulgated under this section.

(3) The department, after notice and opportunity for a hearing, may deny, suspend, or revoke a license for the performance of inspections by a registered motor vehicle repair facility under this act, if the department finds that an applicant, a licensee, or an agent of an applicant or licensee has done any of the following:

(a) Committed fraud, misrepresentation, trickery, or deceit in connection with the inspection or repair of a motor vehicle under this act or a rule promulgated under this act.

(b) Violated this act or a rule promulgated under this act.

(4) Instead of proceeding under subsection (3), or as a means of settling a matter pursued under subsection (3), the department may do any of the following:

(a) Enter into an assurance of discontinuance with an applicant or licensee.

(b) Enter into a probation agreement with an applicant or licensee.

(c) Enter into a suspension, revocation, or denial agreement with an applicant or licensee.

§257.1060

Sec. 10. (1) A certificate of compliance shall be issued according to the rules promulgated pursuant to section 7 to the owner of a motor vehicle that passes an inspection or reinspection.

(2) A waiver shall be issued to the owner of a motor vehicle only according to the rules promulgated pursuant to section 7.

(3) The certificate of compliance and waiver shall be on forms prescribed by the department.

(4) The department shall not issue a registration or transfer the registration of a motor vehicle required to be inspected under this act and the rules promulgated under this act unless 1 of the following occurs:

(a) The motor vehicle is exempt from this act as provided in section 12.

(b) The owner of the motor vehicle presents a certificate of compliance that was issued within the previous 6 months.

(c) The owner of the motor vehicle presents a waiver issued pursuant to the rules promulgated under this act.

(d) The owner of a motor vehicle that is registered in another state presents evidence that the motor vehicle passed an inspection performed within the previous 6 months in another state under procedures, requirements, and standards comparable to those under this act or the rules promulgated under this act.

(e) The owner of the motor vehicle presents evidence that the motor vehicle was purchased as a new motor vehicle within the previous 12 months.

(f) The owner of the motor vehicle submits an application for registration or transfer or registration in a county which is not part of an affected area, and the owner presents evidence as prescribed by the rules promulgated by the department pursuant to Act No. 306 of the Public Acts of 1969, as amended, that the owner's permanent place of residence is not in a county in an affected area.

§257.1061

Sec. 11. (1) The owner of a motor vehicle that is required to be inspected under this act or the rules promulgated under this act and that has failed the inspection shall have the motor vehicle repaired according to the written results of the inspection issued pursuant to the rules promulgated under this act. The owner of the motor vehicle shall have the motor vehicle reinspected. The owner may have the motor vehicle reinspected once, with no additional fee, if the motor vehicle is presented for reinspection not more than 90 days after the inspection which the motor vehicle failed.

(2) A repair that is required to be made under subsection (1) may be made by the owner of the motor vehicle or a person authorized to make the repair under Act No. 300 of the Public Acts of 1974, as amended, this act, and the rules promulgated under this act.

(3) If the estimated cost of necessary repairs under this section exceeds $50,00, as determined pursuant to the rules promulgated under this act, then the owner shall obtain a low emission tune-up before a certificate of compliance is issued for the motor vehicle.

(4) If the estimated cost of necessary repairs under this section is $50,00 or less, as determined pursuant to the rules promulgated under this act, then the necessary repairs to the motor vehicle shall be performed.

(5) In determining the cost of necessary repairs under this section, the following shall not be included:

(a) Costs covered by any warranty, insurance policy, or prepaid maintenance agreement for the benefit of the motor vehicle owner.

(b) Costs necessary to repair or replace an emissions control device which has been tampered with in violation of section 13.

(6) The dollar amount specified in subsections (3) and (4) shall be applicable in 1981. Thereafter, the dollar amount shall be adjusted by the department on January 1 of each year to reflect the percentage change in the consumer price index for all urban consumers, United States city average, as determined by the United States department of labor. The department shall annually publish a newspaper of general circulation in an affected area determined under section 6 any change required by this section and shall inform persons presenting vehicles for inspection of the repair cost limit currently in effect.

§257.1062

Sec. 12. (1) The following motor vehicles are exempt from this act:

(a) A motor vehicle produced before the 1972 model year.

(b) A new motor vehicle as defined in section 33a of Act No. 300 of the Public Acts of 1949, being section 257.33a of the Michigan Compiled Laws.

(c) A motorcycle, as defined in section 31 of Act No. 300 of the Public Acts of 1949, being section 257.31 of the Michigan Compiled Laws.

(d) A moped, as defined in section 32b of Act No. 300 of the Public Acts of 1949, being section 257.32b of the Michigan Compiled Laws.

(e) A motor vehicle powered by a diesel engine.

(f) A motor vehicle that is electrically powered.

(g) A motor vehicle that is exempt under the terms of rules promulgated pursuant to section 7(1)(j).

(2) A waiver of certificate of compliance is not required for a motor vehicle described in this section.

§257.1063

Sec. 13. (1) A person shall not tamper with a motor vehicle. This subsection does not apply to either the repair of an emission control device, or an element of an emission control device; or to the installation of a different emission control device, or element of an emission control device if the different device or element is certified by the federal environmental protection agency.

(2) A person shall not advertise an offer to, or offer to, tamper with a motor vehicle, except an offer to replace an emission control device or an element of the device with an emission control device or an element of the device certified by the federal environmental protection agency.

(3) This section does not apply to the operation of a motor vehicle for the purpose of testing the effectiveness of an emission control device or for the purpose of adjusting the engine of the motor vehicle during repair.

§257.1064

Sec. 14. (1) A person who violates this act is guilty of a misdemeanor, punishable by imprisonment for not more than 30 days, or a fine of not more than $500.00, or both.

(2) A person who violates section 13(1) is subject to the penalties provided in subsection (1) and shall be ordered by the sentencing court to have his or her motor vehicle repaired and inspected so that the motor vehicle complies with this act and the rules promulgated under this act.

§257.1065

Sec. 15. The inspection and maintenance program required under this act shall take effect not later than a date specified by the federal environmental protection agency.

§257.1066

Sec. 16. At such time as the department of natural resources determines that any affected area as defined in section 3(1) has attained and will maintain the national ambient air quality standards for ozone and carbon monoxide as required by federal statutory and federal regulatory requirements of 42 U.S.C. 7401 to 7626, such affected area shall be exempt from the requirements of this act.

§257.1067

Sec. 17. The department shall establish procedures for receiving and investigating complaints relating to inspection and repair of motor vehicles under this act.

§257.1068

Sec. 18. If the department of natural resources determines that a county previously included within an affected area has attained and will maintain the national ambient air quality standards for ozone and carbon monoxide as required by the clean air act, 42 U.S.C. 7401 to 7626, then that county shall be immediately exempt from the requirements of this act.

§257.1069

Sec. 19. The department shall not enforce this act if a court competent jurisdiction issues an injunction or restraining order against the United States environmental protection agency to prohibit the imposition of any sanctions against the state of Michigan for failure to comply with the federal clean air act, 42 U.S.C. 7401 to 7626, as amended, until the injunction or restraining order is rescinded.

§257.1070

Sec. 20. (1) The attorney general shall bring a suit against the United States environmental protection agency to challenge the denial of stationary source pollution permits and the withholding of federal funds because of the lack of an approved state auto emissions inspection program.

(2) The attorney general shall seek an immediate injunction to end the current sanctions pending the outcome of the suit filed pursuant to subsection (1).

§257.1071

Sec. 21. A maximum inspection fee which may be required by rule to be paid by the motor vehicle owner shall not be more than $10.00 per vehicle.

§257.1072

Sec. 22. (1) An owner or lessee of 10 or more motor vehicles that are subject to inspection under this act may apply to the department for a permit to establish a fleet testing station. A fleet testing station permit shall be renewed annually.

(2) A fleet testing station permit shall be issued by the department if the applicant complies with the applicable rules promulgated pursuant to sections 7 and 8 and meets all of the following requirements:

(a) Maintains and repairs the fleet on a regular basis.

(b) Has available the equipment and trained personnel required to perform tests required by rules promulgated pursuant to sections 7 and 8.

(c) Agrees to maintain and report to the department data required by the department and to permit agents of the department to enter and inspect the testing station equipment, premises, and records.

(3) The holder of a fleet testing station permit shall provide for the inspection of each fleet vehicle subject to inspection under this act, any repairs that are necessary to bring the vehicle into compliance with this act, and shall report the results of the inspection and repairs to the department. The holder of a fleet testing station permit shall not issue waivers.

§257.1073

Sec. 23. This act shall expire December 31, 1987.

§257.1074

Sec. 24. This act shall not take effect unless House Bill No. 5368 of the 1979 regular session of the legislature is enacted into law.

[*Editor's note:* HB 5368 the 1979 session, relating to vehicle registration, was enacted as Public Act of 1980, No. 84.]

MINNESOTA

MINNESOTA MOTOR VEHICLE EMISSIONS INSPECTION ACT

(Minnesota Statutes Annotated, Volume 9 — Environmental Protection, Chapter 116 — Pollution Control Agency; Enacted by Laws of 1988, Chapter 661)

Administering Agency: Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155

116.60 Definitions.

Subdivision 1. Applicability. The definitions in this section apply to sections 1 to 6.

Subd. 2. Agency. "Agency" means the pollution control agency.

Subd. 3. Certificate of compliance. "Certificate of compliance" means a serially numbered written instrument or device indicating that a motor vehicle complies with the standards and criteria adopted by the agency under section 3.

Subd. 4. Certificate of waiver. "Certificate of waiver" means a serially numbered written instrument or device indicating that the requirement of compliance with the standards and criteria of the agency has been waived for a motor vehicle under section 3.

Subd. 5. Department. "Department" means the department of public safety.

Subd. 6. Metropolitan area. "Metropolitan area" has the meaning given in section 473.121.

Subd. 7. Motor vehicle. "Motor vehicle" means a passenger automobile, station wagon, pickup truck, or van, as defined in section 168.011, licensed for use on the public streets and highways.

Subd. 8. Public inspection station. "Public inspection station" means a facility for motor vehicle inspection operated under contract with the agency under section 3.

Subd. 9. Fleet inspection station. "Fleet inspection station" means a facility for the inspection of motor vehicle fleets operated under license issued by the agency under section 3.

Subd. 10. Owner. "Owner" has the meaning given it in section 168.011.

Subd. 11. Registrar. "Registrar" means the registrar of motor vehicles under section 168.33.

116.61 Inspection required.

Subdivision 1. Requirement. (a) Beginning no later than July 1, 1991, each motor vehicle registered to an owner residing in the metropolitan area and each motor vehicle customarily domiciled in the metropolitan area but exempt from registration under section 168.012 or 473.448 must be inspected annually for air pollution emissions as provided in sections 1 to 6.

(b) The inspections must take place at a public or fleet inspection station. The inspections must take place within 90 days prior to the registration deadline for the vehicle or, for vehicles that are exempt from license fees under section 168.012 or 473.448, at a time set by the agency.

(c) The registration on a motor vehicle subject to paragraph (a) may not be renewed unless the vehicle has been inspected for air pollution emissions as provided in sections 1 to 6 and received a certificate of compliance or a certificate of waiver.

Subd. 2. Exempt vehicles. The following motor vehicles are exempt from the requirements of this section:

(1) a motor vehicle manufactured before the 1976 model year or with an engine manufactured before the 1976 model year.

(2) a motor vehicle registered as classic, pioneer, collector, or street rod under section 168.10;

(3) a motor vehicle that is exempted in accordance with rules of the agency because the vehicle, although registered to an owner residing in the metropolitan area, is customarily domiciled outside of the metropolitan area; and

(4) any class of motor vehicle that is exempted by rule of the agency because the vehicles present prohibitive inspection problems or are inappropriate for inspection.

116.62 Motor vehicle inspection program.

Subdivision 1. Establishment. The agency shall establish and administer a program to test and inspect for air pollution emissions the motor vehicles that are subject to the requirement of section 2.

Subd. 2. Criteria and standards. (a) The agency shall adopt rules for the program under chapter 14 establishing standards and criteria governing the testing and inspection of motor vehicles for air pollution emissions.

(b) The rules must specify maximum pollutant emission levels for motor vehicles, giving consideration to the levels of emissions necessary to achieve applicable federal and state air quality standards. The standards may be different for different model years, sizes, and types of motor vehicles.

(c) The rules must establish testing procedures and standards for test equipment used for the inspection. The test procedures or procedures producing comparable results must be available to the automobile pollution equipment repair industry. The test equipment used for the inspection or comparable equipment must be available to the repair industry on the open market.

(d) The rules must establish standards and procedures for the issuance of licenses for fleet inspection stations.

(e) The rules must establish standards and procedures for the issuance of certificates of compliance and waiver.

Subd. 3. Public inspection stations: contract. (a) The program shall provide for the inspection of motor vehicles at public inspection stations. The number and location of the stations must provide convenient public access.

(b) The agency shall contract with a private entity for the design, construction, equipment, establishment, maintenance, and operation of the public inspection stations and the provision of related services and functions. The contractor and its officers and employees may not be engaged in the business of selling, maintaining, or repairing motor vehicles or selling motor vehicle replacement or repair parts, except that the contractor may repair any motor vehicle owned or operated by the contractor. The contractor's employees are not employees of the state for any purpose. In evaluating contractors, the agency shall consider the contractors' policies and standards on working conditions of employees. Contracts must require the contractor to operate the public inspection stations for a minimum of five years and may provide for equitable compensation, from the vehicle emission inspection account established by section 6, for capital costs and other appropriate expenditures to the contractor, as determined by the agency.

(c) A public inspection station shall inspect and reinspect motor vehicles in accordance with the agency rules and contract. The inspection station shall issue a certificate of compliance for a motor vehicle that has been inspected and determined to comply with the standards and criteria of the agency adopted under this section. If a certificate of compliance cannot be issued, the inspection station shall provide a written inspection report describing the reasons for rejection and, when appropriate, the repairs needed or likely to be needed to bring the vehicle into compliance with the standards and criteria.

(d) The agency shall develop a means of responding to inquiries from members of the public about the current status of a motor vehicle under the program, including the last date of inspection, certification of compliance, and the terms under which a certificate of waiver has been issued. The agency shall ensure in its public information program that the public is aware of this service. The agency may contract for the provision of this service.

Subd. 4. Fleet inspection stations; license. (a) The program shall provide for the licensing of fleet inspection stations by the agency. The license must be issued by the agency, upon payment of a licensing fee in a manner and an amount prescribed by the agency, when the agency determines that an applicant satisfies the requirements of this section and agency rules.

(b) Owners of a fleet of 50 or more motor vehicles may apply for a fleet inspection station license. Two or more persons each owning 25 or more motor vehicles may apply jointly for a fleet inspection station license.

(c) A licensee shall have the facilities, equipment, and personnel to competently perform the inspections required by sections 1 to 6 and the rules of the agency. A licensee shall provide for the inspection of each fleet vehicle in accordance with the requirements of section 2 and before registration of the vehicle shall indicate in a manner prescribed by the agency whether the vehicle complies with the emission standards of the agency.

(d) A fleet inspection station license authorizes and obligates the licensee to perform inspections only on motor vehicles owned or operated exclusively by the fleet licensee.

(e) A licensee shall maintain records of all inspections in a manner prescribed by the agency and shall make the records available for inspection by authorized representatives of the agency during normal business hours.

(f) To ensure compliance, the agency may require fleet licensees to submit motor vehicles designated by the agency numbering five percent or five motor vehicles, whichever is larger, but no more than 25 vehicles, to annual inspection at public inspection stations.

Subd. 5. Certificates of Waiver. (a) A certificate of waiver, valid for one year, must be issued for a motor vehicle following inspection if:

(1) A low emissions adjustment has been performed on the vehicle, following inspection and within 90 days prior to the renewal of registration, and

(2) either the estimated cost of repairs and adjustments necessary to bring the vehicle into compliance with emissions standards or the actual cost of repairs already performed on a vehicle in accordance with the inspection report under subdivision 3 exceeds the repair cost limit.

(b) The following costs may not be considered in determining eligibility for waiver under paragraph (a): costs for repairs made under warranty and costs necessary to repair or replace any emission control equipment that has been removed, dismantled, tampered with, misfueled, or otherwise rendered inoperative in violation of section 325E.0951.

(c) The repair cost limit is $75 for vehicles manufactured before the 1981 model year, and $200 for vehicles manufactured in the 1981 model year and after.

(d) A temporary certificate of waiver, valid for not more than 30 days, may be issued to a vehicle to allow time for inspection and necessary repairs and adjustments.

Subd. 6. Federal grants. The agency shall apply for and accept on behalf of the state any funds made available by the federal government or by any other sources for motor vehicle pollution control programs.

Subd. 7. Studies; data collections; annual report. The agency shall collect data and undertake studies necessary to evaluate the cost, effectiveness, and benefits of the motor vehicle inspection program. The agency shall compile data on failure rate, compliance rate, the number of certificates issued, and other similar matters. The agency shall report on the operation of the motor vehicle inspection program to the legislature by January 1, 1992, and every two years thereafter.

Subd. 8. Public information; training. The agency shall design, prepare, and implement a public information program for the motor vehicle inspection program, in cooperation with the department and the contractor under section 3, subdivision 3. The program must include material for distribution, presentations, mass media releases, and other appropriate material.

116.63 Prohibited acts.

Subdivision 1. Wrongful certification. No person may issue a certificate of compliance for a motor vehicle that has not been inspected in accordance with or is not in compliance with the rules of the agency.

Subd. 2. Referral for parts or repair. An employee, owner, or operator of a public inspection station may not furnish information, except information provided by the state, about the name or other description of a parts or repair facility or other place where parts, repairs, or adjustments may be obtained to bring a motor vehicle into compliance with the rules of the agency.

Subd. 3. Alteration. A person may not materially alter or change any equipment or mechanism of a motor vehicle that has been certified to comply with the rules of the agency, so that the motor vehicle is no longer in compliance with those rules.

Subd. 4. False repair costs. A person may not provide false information to a public inspection station or the agency about estimated or actual repair costs or repairs needed to bring a motor vehicle into compliance with the standards of the agency. A person may not claim an amount spent for repair if the repairs were not made or the amount not spent.

116.64 Inspection fee.

Subdivision 1. Amount. Beginning January 1, 1991, an annual fee established in accordance with the rules of the agency, not to exceed $10, is imposed for the cost of the inspection of a motor vehicle at a public inspection station and such reinspections as the rules of the agency allow, the cost of the contract entered under section 3, subdivision 3, and the administrative costs of the agency and the department.

Subd. 2. Application. The fee must be paid for each motor vehicle inspected at a public inspection station, including a motor vehicle that is exempt from license fees under section 168.012 or 473.448.

Subd. 3. Payment. The fee must be paid to the registrar at the time that the motor vehicle is reregistered or, for vehicles exempt from license fees under section 168.012 or 473.488, at a time set by the agency.

116.65 Vehicle emission inspection account.

Subdivision 1. Establishment; purpose. A vehicle emission inspection account is created in the state treasury and may be used only to pay the cost of the motor vehicle inspection program and the costs of the agency and department to administer section 1 to 6.

Subd. 2. Revenue source. Revenue from the following sources must be deposited in the vehicle emission inspection account:

(1) money recovered by the state under section 4, and money paid under any agreement, stipulation, or settlement;

(2) money received by the agency in the form of gifts, grants, reimbursements, or appropriations from any source intended to be used for the purpose of the account;

(3) fleet inspection station licensing fees;

(4) interest attributable to investment of money deposited in the fund; and

(5) the proceeds of the inspection fee.

Subd. 3. Appropriation. By the end of the initial contract entered by the agency under section 3, subdivision 3, the amounts appropriated from the motor vehicle transfer fund to the vehicle emission inspection account must be repaid to the transfer fund, and the amounts necessary for this repayment are appropriated from the vehicle emission inspection account.

MISSOURI

(A) The owner or operator of an installation who achieves compliance with this rule through the use of a natural gas-fired afterburner may discontinue operation of said afterburner for a period not longer than six (6) consecutive months beginning October 15 and ending April 15 if—

1. Said afterburner is not used to control orders; and

2. The discontinuance of operation will not violate local ordinances.

(B) If in the opinion of the director the discontinued operation of an afterburner causes a nuisance, said afterburner shall be operated in a manner prescribed by the director.

10 CSR 10-5.370 Control of Emissions from the Application of Deadeners and Adhesives

(1) Applicability.

(A) This rule shall apply throughout St. Louis City and Jefferson, St. Charles, Franklin and St. Louis Counties.

(B) This rule applies to all installations which have the uncontrolled potential to emit more than one hundred (100) tons per year or two hundred fifty (250) kilograms per day of volatile organic compounds from the application of automotive underbody deadeners and adhesives. This rule shall also apply to any installation which does not have an allowable VOC emission limit established under 10 CSR 10-6.060 or legally enforceable state implementation plan revision and which has uncontrolled potential emissions greater than or equal to two hundred fifty (250) kg/day or one hundred (100) tons per year. The uncontrolled potential to emit is the potential emissions (as defined) plus the emissions removed by control devices.

(2) Definitions of certain terms specified in this rule may be found in 10 CSR 10-6.020.

(3) General Provisions.

(A) No person shall emit to the atmosphere any volatile organic compounds (VOC) from the application of automotive underbody deadeners and adhesives in excess of the emission limit in section (4).

(B) The emission limit contained in section (4) shall be based on a daily weighted average of all deadeners and/or adhesives to the coating applicator.

(4) Emission Limitations and Dates of Compliance

Application Process	Emission Limit lb/gal Coating (minus water) and non-VOC organic compounds	Dates of Compliance
Chrysler Corp. Car-Deadeners	2.22	7/31/85
Vinyl Top Adhesives	3.33	7/31/85

(5) Recordkeeping.

(A) The owner or operator of a deadeners and/or adhesive application covered by this rule shall keep records detailing specific VOC sources as necessary to demonstrate daily compliance. These may include daily records of the amount of deadener and/or adhesive used, the composition of deadener and/or adhesive, solvent used, solvent discarded and production levels.

(B) Records such as daily production rates may be submitted for actual daily use measurements provided the owner submits a demonstration approvable by the director that these records are adequate for the purpose of this rule.

(C) Records of all information required under (5)(A) and (B) shall be kept for a period of not less than two (2) years, and all such records shall be made available to the director upon request.

(6) Compliance Methods. Compliance with this rule shall be demonstrated using the test method referenced at 10 CSR 10-6.030(13)(C) to determine deadener composition. The deadener manufacturer's formulation data may be used to demonstrate compliance, but only after confirmation by the test method previously referenced.

10 CSR 10-5.380 Motor Vehicle Emissions Inspection

(1) Applicability. This rule shall apply to all motor vehicles powered totally or part by gasoline which are registered after January 1, 1984 in the counties of Saint Charles, Jefferson, Saint Louis, and the city of Saint Louis. The following classes of vehicles are exempt from the emissions inspection:

(A) Motor vehicles registered [for over] as or in excess of six thousand (6,000) pounds GVW;

(B) Motorcycles, dirt bikes, and motortricycles;

(C) Model-year vehicles prior to 1971;

(D) School buses;

(E) Diesel-powered vehicles; and

(F) New motor vehicles not previously registered.

(2) Emission Standards. The emission standards are as follows:

Model Year	*Hydrocarbon (PPM)*	*Carbon Monoxide (%)*
1971-74	700	7.0
1975-79	600	6.0
1980	300	3.0
1981 and later	220	1.2

(3) Determination of Compliance. A vehicle will be deemed as in compliance with the standards of section (2) when it has successfully passed a valid emissions test at a state approved inspection facility.

10 CSR 10-5.390 Control of Emissions from Manufacture of Paints, Varnishes, Lacquers, Enamels and Other Allied Surface Coating Products

(A) This rule shall apply throughout St. Louis City, Jefferson, St. Charles, Franklin and St. Louis Counties.

(B) This rule applies to all installations which have the uncontrolled potential to emit more than two hundred fifty (250) kilograms per day or one hundred (100) tons per year of volatile organic compounds (VOC) from the manufacture of paints, varnishes, enamels and other allied surface coating products.

(2) Definitions of certain terms specified in this rule may be found in 10 CSR 10-6.020.

(3) General. No owner or operator of a manufacturing installation subject to this rule and producing the products listed in section (1) shall cause or allow the manufacture of these products unless the operating equipment meets the requirements contained in this rule, and without adhering to operating procedures specified in this rule and operating procedures recommended by the equipment manufacturer and approved by the director.

(4) Operating Equipment and Operating Procedure Requirements.

(A) Tanks storing VOC with a vapor pressure greater than or equal to 10 kPa (1.5 psi) at twenty degrees centigrade (20° C), shall be equipped with pressure/vacuum conservation vents set at +/−0.2 kPa (.029 psi), except where more effective air pollution control is used and has been approved by the director. Stationary VOC storage containers with a capacity greater than two hundred fifty (250) gallons shall be equipped with a submerged-fill pipe or bottom fill, except where more effective air pollution control is used and has been approved by the director.

NEBRASKA

NEBRASKA MOTOR AND DIESEL-POWERED MOTOR VEHICLE ACT

(Nebraska Revised Statutes, Chapter 60 — Motor Vehicles, Article 22, Control of Smoke Emissions and Noise; Enacted by Laws of 1972, Legislative Bill 1360; Amended by Laws of 1976, LB 823; Laws of 1977, LB 39; Laws of 1979, LB 140)

60-2201. Terms, defined. As used in sections 60-2201 to 60-2212, unless the context otherwise requires:

(1) Diesel-powered motor vehicle shall mean a self-propelled vehicle designed primarily for transporting persons or property on a public street or highway and which is powered by an internal combustion engine of the compression ignition type;

(2) Motor vehicle shall mean a self-propelled vehicle with a gross unloaded vehicle weight of ten thousand pounds or more, or any combination of vehicles of a type subject to registration, towed by such motor vehicle;

(3) Smoke shall mean the solid or liquid matter, except water, discharged from a motor vehicle engine which obscures the transmission of light;

(4) Smokemeter shall mean a full flow light-extinction smokemeter of a type approved by the Department of Environmental Control and operating on the principles described in the federal standards;

(5) Opacity shall mean the degree to which a smoke plume emitted from a diesel-powered motor vehicle engine will block the passage of a beam of light expressed as a percentage;

(6) Smoke control system shall mean a system consisting of one or more devices and adjustments designed to control the discharge of smoke from diesel-powered motor vehicles;

(7) Administrator shall mean the Director of Environmental Control of the State of Nebraska;

(8) State enforcement officials shall mean officials of the Department of Environmental Control; and

(9) This act shall mean sections 60-2201 to 60-2212.

60-2202. Act applicable. Sections 60-2201 to 60-2212 shall apply to all diesel-powered motor vehicles operated within this state with the exception of the following:

(1) Emergency vehicles operated by federal, state and local government authorities;

(2) Vehicles which are not required to be registered in accordance with applicable motor vehicle laws of this state;

(3) Vehicles used for research and development which have been approved by the administrator;

(4) Vehicles being operated while undergoing maintenance;

(5) Vehicles operated under emergency conditions;

(6) Vehicles being operated in the course of training programs which have been approved by the administrator; and

(7) Other vehicles expressly exempted by the administrator.

60-2203. Diesel-powered motor vehicle; smoke; shade, density, or opacity. No one shall operate a diesel-powered motor vehicle on any public street or highway in this state in such a manner that smoke discharged from the exhaust is of a shade or density equal to or darker than that designated as Number 1 of the Ringelmann Chart of equivalent opacity of twenty percent for ten consecutive seconds or longer.

60-2204. Smoke control system; removal or change; prohibited; exception. No one shall intentionally make a change or other alteration to any diesel-powered motor vehicle equipped by its manufacturer with a smoke control system, including the basic fuel system, that may limit the ability of the system to control smoke, and no one shall remove such a smoke control system except for repair or installation of a proper replacement.

60-2205. Enforcement of act; citations; use of smokemeter; results; admissible as evidence. (1) State and local enforcement officials shall have the authority to issue citations to suspected violators of the provisions of sections 60-2201 to 60-2212 on the basis of their visual evaluation of the smoke emitted from a diesel-powered motor vehicle, and such citations shall give the suspected violator a reasonable time to furnish evidence to the Department of Environmental Control that such alleged violation has been corrected or else such suspected violator shall be subject to the penalties set out in section 60-2211; *Provided*, that a suspected violator may demand that the suspected vehicle be tested by an approved smokemeter prior to a trial on the alleged violation.

(2) Smokemeter tests shall be conducted (a) by or under the supervision of a person or testing facility authorized by the administrator to conduct such tests, and (b) by installing an approved smokemeter on the exhaust pipe and operating the suspected vehicle at engine revolutions per minute equivalent to the engine revolutions per minute at the time of the alleged violation.

(3) The results of smokemeter tests run in accordance with the provisions of sections 60-2201 to 60-2212 and after the alleged violation shall be admissible as evidence in legal proceedings.

60-2206. Administrator; powers; rules and regulations; control of noise or emissions. (1) The administrator shall have the power, after public hearings on due notice, to promulgate, consistent with and in furtherance of the provisions of sections 60-2201 to 60-2212, rules and regulations in accordance with which he will carry out his responsibilities and obligations under the provisions of sections 60-2201 to 60-2212.

(2) Any rules or regulations promulgated by the administrator pursuant to sections 60-2201 to 60-2212 shall be consistent with the provisions of the federal standards, if any, relating to control of emissions from the diesel-powered motor vehicles affected by such rules and regulations. The administrator shall not require, as a condition for the sale of any diesel-powered motor vehicle covered by the provisions of sections 60-2201 to 60-2212, the inspection, certification, or other approval of any feature or equipment designed for the control of noise or emissions from such diesel-powered motor vehicles, if such feature or equipment has been certified, approved, or otherwise authorized pursuant to laws or regulations of any federal governmental body as sufficient to make lawful the sale of any diesel-powered motor vehicle covered by sections 60-2201 to 60-2212.

60-2207. Noise; restrictions. No person shall sell, or offer for sale, a new motor vehicle with a gross vehicle weight of ten thousand pounds or more that produces a maximum noise exceeding the following noise limit at a distance of fifty feet from the centerline of travel under test procedures established by section 60-2210: (1) After January 1, 1972, 88dB(A); (2) after January 1, 1973, 86dB(A); (3) after January 1, 1975, 84dB (A); (4) after January 1, 1978, 83dB(A); and (5) after January 1, 1982, 80dB(A).

60-2208. Operation; noise; limitation. No person shall operate within the speed limits specified in this section either a motor vehicle with a gross vehicle weight of ten thousand pounds or more or any combination of vehicles of a type subject to registration, towed by such motor vehicle, at any time or under any condition of grade, load, acceleration, or deceleration in such manner as to exceed the following noise limit based on a distance of not less than fifty feet from the centerline of travel under test procedures established by section 60-2210: When the posted speed limit is thirty-five miles per hour or less, the noise limit shall not exceed 86dB (A) and when the posted speed limit is more than thirty-five miles per hour the noise limit shall not exceed 90 dB (A); *Provided*, that this section shall apply to the total noise from a vehicle or combination of vehicles and shall not be construed as limiting or precluding the enforcement of any other provisions of sections 60-2201 to 60-2212 relating to motor vehicle mufflers for noise control.

60-2209. Exhaust or intake muffler; change; increase of noise; prohibited. No person shall modify or change the exhaust muffler, intake muffler, or any other noise abatement device of a motor vehicle in a manner such that the noise emitted by the motor vehicle is increased above that emitted by the vehicle as originally manufactured. Procedures used to establish compliance with this section shall be those used to establish compliance of a new motor vehicle with the requirements of sections 60-2201 to 60-2212.

60-2210. Noise measurement tests; manner conducted; conditions; enumerated. (1) Noise measurements shall be made at a test site which is adjacent to, and includes a portion of, a traveled lane of a public highway. A microphone target point shall be established on the centerline of the traveled portion of the highway, and a microphone location point shall be established on the ground surface at a distance of fifty feet from the microphone target point and on a line that is perpendicular to the centerline of the traveled portion of the highway and that passes through the microphone target point. The microphone shall be placed such that it is at a height of not less than two feet and not more than six feet above the plane of the roadway surface. The test area shall include an open site within a fifty-foot radius of both the microphone target point and the microphone location point. The test site shall be essentially free of large sound-reflecting objects.

(2) Noise measurement conditions shall be as follows:

(a) Noise measurements may only be made if the measured average wind velocity is twelve miles per hour or less. Gust wind measurements of up to twenty miles per hour shall be allowed;

(b) Measurements shall be prohibited under any condition of precipitation, but measurements may be made with snow on the ground. The ground surface within the measurement area shall be free of standing water; and

(c) Road conditions shall be such that they would not cause a motor vehicle to emit irregular tire, body, or chassis-impact noise.

(3) In accordance with this section, a measurement shall be made of the sound level generated by a motor vehicle operating through the measurement area on the traveled portion of the highway within the test site, regardless of the highway grade, load, acceleration, or deceleration. The sound level generated by the motor vehicle shall be the highest reading observed on the sound level measurement system as the vehicle passes through the measurement area.

60-2211. Standards; violations; penalty. Every person who operates a diesel-powered or other motor vehicle in this state in violation of the standards established by the provisions of sections 60-2201 to 60-2212 shall be guilty of a Class V misdemeanor, and every day that the diesel-powered or other motor vehicle is so operated shall be deemed to be a separate offense.

60-2212. Smoke from diesel-powered motor vehicles; act, provisions exclusive. The provisions of sections 60-2201 to 60-2212 shall be exclusive and prevail over other provisions of law in this state or any of its subdivisions applied to smoke from diesel-powered motor vehicles.

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statutes relating to planning and zoning consider the effects of possible air pollution and shall submit to the department for evaluation such concise statement of the effects on air quality by complex sources.

445.596 Private rights and remedies not affected. NRS 445.401 to 445.586, inclusive, does not abridge, limit, impair, enlarge or otherwise affect substantively or procedurally the right of any person to damages or other relief on account of injury to persons or property and to maintain any action or other appropriate proceeding therefor in the courts of this state or the courts of the United States on a tort claim against the United States or a federal agency as authorized by federal statutes.

445.598 Provisions for transition in administration. 1. All rules, regulations and standards promulgated by the state commission or environmental protection pertaining to air pollution control in force on July 1, 1973, shall remain in effect until such time as revised by the state environmental commission pursuant to NRS 445.401 to 445.601, inclusive.

2. Any and all action taken by the state commission of environmental protection, including but not limited to existing orders, notices of violation, variances, permits, cease and desist orders and compliance schedules, shall remain in full force and effect and binding upon the state environmental commission, the director, the department and all persons to whom such action may apply on or after July 1, 1973.

3. In the event that a local air pollution control program described in NRS 445.546 is transferred in whole or in part from an existing air pollution control agency to another agency, all rules and regulations adopted by the existing agency may be readopted as amended to reflect the transfer of authorities by the new agency immediately upon such transfer, and the provisions of NRS 445.466 shall not apply to such readoption.

4. If a transfer of local authority as described in subsection 3 occurs, all orders, notices of violation, variances, cease and desist orders, compliance schedules and other legal action taken by the existing air pollution control board, control officer, or hearing board shall remain in full force and effect, and shall not be invalidated by reason of such transfer.

PENALTIES

445.601 Administrative fine; fine not bar to injunctive relief or other remedy; disposition of fine.

1. Any person who violates any provision of NRS 445.401 to 445.526, inclusive, and 445.546 to 445.601, inclusive, or any regulation in force pursuant thereto, other than NRS 445.576 on confidential information, is guilty of a civil offense and shall pay an administrative fine levied by the commission of not more than $5,000. Each day of violation constitutes a separate offense.

2. The commission shall by regulation establish a schedule of administrative fines not exceeding $500 for lesser violations of any provision of NRS 445.401 to 445.526, inclusive, and 445.546 to 445.601, inclusive, or any regulation in force pursuant thereto.

3. Action pursuant to subsection 1 or 2 is not a bar to enforcement of the provisions of NRS 445.401 to 445.526, inclusive, and 445.546 to 445.601, inclusive, regulations in force pursuant thereto, and orders made pursuant to NRS 445.401 to 445.526, inclusive, and 445.546 to 445.601, inclusive, by injunction or other appropriate remedy, and the commission or the director may institute and maintain in the name of the State of Nevada any such enforcement proceedings.

4. All administrative fines collected by the commission pursuant to this section shall be deposited in the county school district fund of the county where the violation occurred.

Control of Emissions From Engines

445.610 Definitions. As used in NRS 445.610 to 445.710, inclusive, unless the context otherwise requires:

1. "Approved inspector" means a person licensed by the department of motor vehicles and public safety to inspect motor vehicles and devices for the control of pollution for an authorized station.

2. "Authorized station" means a station licensed by the department of motor vehicles and public safety for inspecting motor vehicles and devices for the control of pollution for compliance with this chapter or any applicable federal or regulation of the commission and for installing, repairing and adjusting such devices to meet the commission's requirements.

3. "Commission" means the state environmental commission.

4. "Evidence of compliance" includes a certificate issued when a motor vehicle has been inspected and:

(a) Has the required equipment; or

(b) Does not meet the requirements for the control of emissions after the repairs have been made and the commission waives compliance.

5. "Fleet station" means a facility which is licensed by the department to conduct inspections of the motor vehicles of qualified owners or lessees.

6. "Motor vehicle" means every self-propelled vehicle in, upon or by which any person or property is or may be transported or drawn upon a public highway except devices moved by human or animal power or used exclusively on stationary rails.

445.620 Commission may prescribe uniform standards for emissions from engines; approval by department of motor vehicles and public safety.

1. The state environmental commission may by regulation prescribe standards for exhaust emissions, fuel evaporative emissions and visible emissions of smoke from mobile internal combustion engines on the ground or in the air, including but not limited to aircraft, motor vehicles, snowmobiles and railroad locomotives.

2. Standards for exhaust emissions which apply to a trimobile must be based on standards which were in effect in the year in which the engine of the trimobile was built.

3. Any such standards which pertain to motor vehicles must be approved by the department of motor vehicles and public safety before they are adopted by the commission.

445.625 Information concerning program for control of emissions from motor vehicles: Collection, interpretation and correlation; public inspection.

1. The commission, in cooperation with the department of motor vehicles and public safety, shall adopt regulations which establish procedures for collecting, interpreting and correlating information concerning programs to control emissions from motor vehicles and any benefits which result from an inspection program.

2. All information received by the commission or the department of motor vehicles and public safety is open to public inspection.

445.630 Regulations of commission: Control of emissions from motor vehicles; program for inspection and testing of motor vehicles.

1. In any county whose population is 100,000 or more, the commission shall, in cooperation with the department of motor vehicles and public safety and any local air pollution control agency, adopt regulations for the control of emissions from motor vehicles in areas of the county designated by the commission.

2. In any county whose population is less than 100,000, if the commission determines that it is feasible and practicable to carry out a program of inspecting and testing motor vehicles and systems for the control of emissions from motor vehicles, and if carrying out the program is deemed necessary to achieve or maintain the prescribed standards for the quality of ambient air in areas of the state designated by the commission, the commission shall, in cooperation with the department of motor vehicles and public safety and any local air pollution control agency established under NRS 445.546 which has jurisdiction in a designated area, adopt regulations and transportation controls as may be necessary to carry out the program.

3. The regulations shall distinguish between light-duty and heavy-duty motor vehicles and may prescribe:

(a) Appropriate criteria and procedures for the approval, installation and use of devices for the control of emissions from motor vehicles; and

(b) Requirements for the proper maintenance of such devices and motor vehicles.

4. The regulations shall establish:

(a) Requirements by which the department of motor vehicles and public safety shall license authorized stations to inspect, repair, adjust and install devices for the control of emissions for motor vehicles, including criteria by which any person may become qualified to inspect, repair, adjust and install those devices.

(b) Requirements by which the department of motor vehicles and public safety may license an owner or lessee of a fleet of three or more vehicles as a fleet station if the owner or lessee complies with the regulations of the commission. The fleet station shall only certify vehicles which constitute that fleet.

(c) Requirements by which the department provides for inspections of motor vehicles owned by this state and any of its political subdivisions.

5. The commission shall consider, before adopting any regulation or establishing any criteria pursuant to paragraph (a) of subsection 3:

(a) The availability of devices adaptable to specific makes, models and years of motor vehicles.

(b) The effectiveness of those devices for reducing the emission of each type of air pollutant under conditions in this state.

(c) The capability of those devices for reducing any particular type or types of pollutants without significantly increasing the emission of any other type or types of pollutant.

(d) The capacity of any manufacturer to produce and distribute the particular device in such quantities and at such times as will meet the estimated needs in Nevada.

(e) The reasonableness of the retail cost of the device and the cost of its installation and maintenance over the life of the device and the motor vehicle.

(f) The ease of determining whether any such installed device is functioning properly.

445.632 Regulations of department of motor vehicles and public safety: Licensing of stations; manner of inspection; fee, bond or insurance; pamphlet for vehicle owner.

1. The department of motor vehicles and public safety shall adopt regulations which:

(a) Prescribe requirements for licensing authorized stations and fleet stations;

(b) Prescribe the manner in which the stations inspect motor vehicles and issue evidence of compliance;

(c) Prescribe the diagnostic equipment necessary to perform the required inspection;

(d) Provide for any fee, bond or insurance which is necessary to carry out the provisions of NRS 445.610 to 445.670, inclusive; and

(e) Provide for the issuance of a pamphlet for distribution to owners of motor vehicles. The pamphlet must contain information explaining the reasons for and the methods of the inspections.

2. The department of motor vehicles and public safety shall issue a copy of the regulations to each authorized station and to each fleet station.

445.634 Inspection of stations; grounds for denial, suspension or revocation of license of inspector or station.

1. The department of motor vehicles and public safety shall establish procedures for inspecting the authorized stations and the fleet stations and may require the holder of a license for an authorized station to submit any material or document which is used in the inspection program.

2. The department may deny, suspend or revoke the license of an approved inspector or authorized station if:

(a) The approved inspector or the holder of a license for an authorized station is not complying with the provisions of NRS 445.610 to 445.670, inclusive.

(b) The holder of a license for an authorized station refuses to furnish the department with the requested material or document.

(c) The approved inspector has issued a fraudulent certificate of compliance whether intentionally or negligently. A "fraudulent certificate" includes, but is not limited to:

(1) A backdated certificate;

(2) A postdated certificate; and

(3) A certificate issued without an inspection.

(d) The approved inspector does not follow the prescribed test procedure.

445.635 Evidence of compliance with compulsory program for inspection of motor vehicles required for certain used motor vehicles. The authority set forth in NRS 445.630 providing for a compulsory motor vehicle emission inspection program is limited as follows:

1. In areas which have been designated by the commission for inspection programs and which are located in counties having a population of 100,000 or more on, or after October 1, 1983, all used motor vehicles being registered or reregistered are required to have evidence of compliance.

2. In designated areas in other counties where the commission puts a program into effect on, or after October 1, 1983, all used motor vehicles being registered are required to have evidence of compliance.

3. The board of county commissioners of a county containing a designated area may revise its program for the designated area after receiving the approval of the commission.

445.640 Evidence of compliance with program for control of emissions required before transfer of used motor vehicle in certain areas.

1. Subject to any applicable limitation of NRS 445.610 to 445.670, inclusive, and any regulation adopted pursuant thereto, no used motor vehicle as defined in NRS 482.132 may be registered in certain areas of this state as designated by the commission unless the application for registration is accompanied by evidence of emission control compliance issued by any authorized station or fleet station certifying that the vehicle is equipped with motor vehicle pollution control devices required by federal regulation or such other requirements as the commission may by regulation prescribe under the provisions of NRS 445.610 to 445.710, inclusive.

2. If the seller of a used vehicle is required, pursuant to the provisions of NRS 482.424, to complete a dealer's report of sale, such seller shall also provide the buyer

with any evidence of emission control compliance required pursuant to subsection 1.

3. The requirements of this section apply only in counties where a program of inspecting and testing motor vehicles and motor vehicle emission control systems has been implemented pursuant to NRS 445.630.

445.650 Exceptions to requirement of compliance with program for control of emissions from motor vehicles. The provisions of NRS 445.640 do not apply to:

1. Transfer of registration or ownership between:

(a) Husband and wife; or

(b) Companies whose principal business is leasing of vehicles, if there is no change in the lessee or operator of the vehicle.

2. Motor vehicles which are subject to prorated registration pursuant to the provisions of NRS 706.801 to 706.861, inclusive, and which are not based in this state.

3. Transfer of registration if evidence of compliance was issued within 90 days before the transfer.

4. Motor vehicles which have been licensed by the department of motor vehicles and public safety as experimental vehicles.

445.660 State department of conservation and natural resources to provide assistance. In furtherance of the provisions of NRS 445.610 to 445.710, inclusive, and the enforcement thereof, the state department of conservation and natural resources shall consult with the department of motor vehicle and public safety and furnish them with technical information, including testing techniques, procedures for quality assurance and standards adopted by the commission and instruction for emission control features and equipment.

445.670 Evidence of compliance with NRS 445.610 to 445.710, inclusive, required before registration of vehicle in certain areas; submission of evidence of compliance by owner or lessee of fleet of vehicles.

1. Except as provided in subsection 2, branch offices of the department of motor vehicles and public safety and county tax assessor offices, acting as agents of the department in the collection of fees for registration, shall not register a vehicle which is based in areas of this state designated by the commission until evidence of compliance with NRS 445.610 to 445.710, inclusive, has been provided.

2. An owner or lessee of a fleet of three or more vehicles may, upon application to the department of motor vehicles and public safety, submit evidence of compliance for his motor vehicles in a manner determined by that department.

445.680 Installation and inspection of device for control of pollution. Any person may install a motor vehicle pollution control device, but no person who is not employed by an authorized station or fleet station may install a device for compensation. No such device shall be deemed to meet the requirements of NRS 445.630 to 445.670, inclusive, or regulations of the commission or department unless it has been inspected in an authorized station or a fleet station and evidence of compliance has been issued by that station.

445.690 Exemption of certain classes of motor vehicles; waiver from provisions of NRS 445.630 to 445.670, inclusive.

1. The commission may provide for exemption from the provisions of NRS 445.630 to 445.670, inclusive, of designated classes of motor vehicles, including classes based upon the year of manufacture of motor vehicles.

2. The commission shall provide for a waiver from the provisions of NRS 445.630 to 445.670, inclusive, if compliance involves repair and equipment costs which exceed the limits established by the commission. The commission shall establish the limits in a manner which avoids unnecessary financial hardship to motor vehicle owners.

445.700 Fees: Amounts; pollution control fund; use of money; maximum fees for inspection.

1. In areas of the state where and when a program is commenced pursuant to NRS 445.630 to 445.670, inclusive, the following fees must be paid to the department of motor vehicles and public safety and accounted for in the pollution control fund which is hereby created as a special revenue fund:

(a) For the issuance and annual renewal of license for an authorized station or a fleet station	$25
(b) For each set of 25 forms certifying emission control compliance	75
(c) For each form issued to a fleet station	3

2. All fees must be used by that department as needed to carry out the provisions of NRS 445.610 to 445.710, inclusive.

3. The department of motor vehicles and public safety may prescribe by regulation routine fees for inspection at the prevailing shop labor rate, including maximum charges for those fees, and for the posting of those fees in a conspicuous place at the authorized station.

445.705 Unlawful acts. It is unlawful for any person to:

1. Possess any unauthorized evidence of compliance;

2. Make, issue or use any imitation or counterfeit evidence of compliance;

3. Willfully and knowingly fail to comply with the provisions of NRS 445.610 to 445.670, inclusive, or any regulation adopted by the department of motor vehicles

and public safety; or

4. Issue evidence of compliance if he is not a licensed inspector of an authorized station or a fleet station.

445.710 Penalties.

1. A violation of any provision of NRS 445.610 to 445.710, inclusive, relating to motor vehicles, or any regulation adopted pursuant thereto relating to motor vehicles, is a misdemeanor. The provisions of NRS 445.610 to 445.710, inclusive, or any regulation adopted pursuant thereto, must be enforced by any peace officer.

2. Satisfactory evidence that the motor vehicle or its equipment conforms to those provisions or regulations, when supplied by the owner of the motor vehicle to the department of motor vehicles and public safety within 10 days after the issuance of a citation pursuant to subsection 1, may be accepted by the court as a complete or partial mitigation of the offense.

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(c) Tires and tubes received at any dump which is authorized to burn by Air 1001.06 shall be separated from the waste and disposed of by other means than open burning.

1001.05 *Salvaging Operations.* No business, trade, or industry engaged in any product or material, such as, but not limited to, reprocessing of used motor oils, metals, chemicals, shipping containers, or drums, and specifically including automobiles, automobile parts and junk yards, shall burn in the ambient air. A suitable incinerator or other means of compliance, approved by the agency shall be employed.

1001.06 *Solid Waste Disposal Areas.* Open burning shall not be permitted at any town, city, county or state solid waste disposal area except as provided in Air 1001.03.

Part 1002 Air Contaminants From a Source Other Than a Stack (Fugitive Dust)

1002.01 *Fugitive Dust Prohibition.* Reasonable precautions shall be taken to prevent, abate, and control the emission of fugitive dust for those activities contained in Air 1002.02. Such precautions shall include: wetting, oiling, covering, applying of chemicals, shielding, vacuuming, or any other appropriate measures.

1002.02 *Activities Controlled.* No person shall cause or allow the following activities without taking and continuing all reasonable precautions to prevent, abate, and control fugitive dust.

(a) Commercial mining activities: the construction, maintenance or operation of a commercial mining or strip mining source or part thereof.

(b) Construction activities: the construction, maintenance, operation, paving, sweeping, trenching, excavation, filling, or other activity associated with, but not limited to, the building of streets, roads, highways, parking lots, shopping centers, or housing developments.

(c) Clearing and demolition activities: the clearing and demolition of buildings, bridges and other structures; maintenance of utilities, sewers, waterlines; or similar activities.

(d) Bulk hauling activities: the operation of bulk hauling activities and the transfer of material on public transportation routes.

1002.03 *Exemptions.* The following are granted exemptions from provisions of Air 1002.

(a) Application of traction enhancement materials including sand, and of de-icing chemicals including road salt, to public transportation routes.

(b) Normal usage of gravel or dirt roads.

(c) Resurfacing of existing highways, but not the removal of excess sand without using reasonable precaution when the surplus material is removed.

(d) Agricultural industry or operations directly associated there with.

Ch. 1100 PREVENTION, ABATEMENT, AND CONTROL OF MOBILE SOURCE AIR POLLUTION

Part 1101 Diesel Engines and Motor Vehicles

1101.01 *Emission Standards for Diesel Engines.* Air 1101.01 shall apply to all diesel engines operated in this state.

(a) No diesel engine manufactured on or after January 1, 1970, shall emit smoke which is in excess of 20 percent opacity, averaged over a 15-second period. No diesel engine manufactured before January 1, 1970, shall emit smoke which is in excess of 30 percent opacity averaged over a 15-second period, and such engines shall conform to the requirements of those manufactured on or after January 1, 1970, by July 1, 1973. Individual smoke puffs shall be permitted provided that they do not exceed 10 seconds duration and 40 percent opacity.

(b) No diesel engine which provides motive power in a bus or truck shall be allowed to idle for more than five consecutive minutes when the bus or truck is not in motion except as provided in Air 1101.02.

(c) No person owning or operating a diesel engine shall alter or remove any smoke control equipment or system (including the basic fuel system) which any limit or reduce the ability of that equipment or system to control smoke except as provided in Air 1101.02.

1101.02 *Exemptions From Diesel Engine Standards.*

(a) When a diesel powered vehicle is forced to remain motionless because of traffic conditions over which the operator has no control, the provisions of Air 1101.01 (a) and (b) shall not apply.

(b) The provisions of Air 1101.01 (b) shall not apply in an area where temperatures below -23°C (-10°F) are predicted. When such idling is permitted by this exception, no nuisance shall be created.

(c) The 5-minute idling limitation of Air 1101.01 (b) may be exceeded when diesel engines are providing power takeoff for refrigeration, lift gate pumps or other auxiliary uses, or to supply heat or air conditioning necessary for passenger comfort in those vehicles intended for commercial passenger transportation.

(d) Diesel engines undergoing maintenance shall be exempt from the provisions of Air 1101.01 (a), (b), and (c), if necessary during such periods of maintenance but only when operated by a qualified mechanic.

1101.03 *Emission Standards for Motor Vehicles.* Air 1101.03 shall apply to all gasoline engine propelled vehicles operated in the state.

(a) All motor vehicles manufactured since the 1967 year model shall comply with all federal laws pertaining to the installation of air pollution control equipment.

(b) No person shall operate a motor vehicle which emits visible smoke, gasses, or fumes (except water vapor or steam) while standing or moving on the roads or highways of the state, except during initial startups and periods of warmups.

(c) No person shall remove, alter, or otherwise render inoperative exhaust emission controls, crankcases, ventilation, or any other air pollution control equipment which was installed as a requirement of federal and New Hampshire state law or rule except as provided in Air 1101.04. Note: "Crankcase" shall mean the 3-dimensional space within an engine which is connected to the oil sump by internal passages through which gases and vapor can flow.

(d) No person shall operate a motor vehicle originally equipped with air pollution control equipment as required by federal or state law or rule unless such equipment is in place and in operating condition.

(e) No gasoline engine which provides motive power in a bus or truck shall be allowed to idle for more than 5 consecutive minutes when the bus or truck is not in motion except as provided in Air 1101.04.

1101.04 *Exemptions From Motor Vehicle Standards.*

(a) The requirements of Air 1101.03 (c) and (d) shall not apply to an alteration or modification to use a fuel other than gasoline where it has been shown that the emission from such modified or altered vehicle is at levels which comply with existing state or federal standards for emissions from motor vehicles.

(b) The provisions of Air 1101.03 (b), (c), and (d) shall not apply to motor vehicles or motorcycles used only for racing on an established raceway, race course, or race track provided that no nuisance of either noise or odor is created.

(c) The 5-minute idling limitation of Air 1101.03 (e) may be exceeded when gasoline engines are providing power takeoff for refrigeration, lift gate pumps, or other auxiliary uses, or to supply heat or air conditioning necessary for passenger comfort in those vehicles intended for commercial passenger transportation.

Part 1102 Vehicle Volume on Roads, Highways and Parking Areas (Indirect Sources) [Repealed]

Ch. 1200 PREVENTION, ABATEMENT, AND CONTROL OF STATIONARY SOURCE AIR POLLUTION

Part Air 1201 Incinerators

1201.01 *Classification of Wastes (Types 1-7) — Defined by the Incinerator Institute of America Standards, Except Type 7.*

(a) Type 0. Trash consisting of a mixture of highly combustible waste such as paper, cardboard cartons, wood boxes, and combustible floor sweepings, from commercial and industrial activities. The mixtures contain up to 10 percent by weight of plastic bags, coated paper, laminated paper, treated corrugated cardboard, oily rags, and plastic or rubber scraps. This type of waste contains 10 percent moisture, 5 percent incombustible solids, and has a heating value of 4718 calories per gram (8500 BTU's per pound) as fired.

(b) Type 1. Rubbish, consisting of a mixture of combustible waste such as paper, cardboard cartons, wood scrap, foliage and combustible floor sweepings, from domestic, commercial and industrial activities. The mixture contains up to 20 percent by weight of restaurant or cafeteria waste but contains little or no treated papers, plastic or rubber wastes. This type of waste contains 25 percent moisture, 10 percent incombustible solids, and has a heating value of 3608 calories per gram (6500 BTU's per pound) as fired.

(c) Type 2. Refuse, consisting of an approximately even mixture of rubbish and garbage by weight. This type of waste is common to apartment and residential occupancy, consisting of up to 50 percent moisture, 7 percent incombustible solids, and has a heating value of 2386 calories per gram (4300 BTU's per pound) as fired.

(d) Type 3. Garbage, consisting of animal and vegetable wastes from restaurants, cafeterias, hotels, hospitals, markets and like installations. This type of waste contains up to 70 percent moisture, 5 percent incombustible solids, and has a heating value of 1388 calories per gram (2500 BTU's per pound) as fired.

(e) Type 4. Human and animal remains, consisting of carcasses, organs and solid organic wastes from hospitals, laboratories, abattoirs, animal pounds and similar sources, consisting of up to 85 percent moisture, 5 percent incombustible solids, and having a heating value of 555 calories per gram (1000 BTU's per pound) as fired.

(f) Type 5. By-product waste, consisting of gaseous, liquid, or semi-liquid, such as tar, paints, solvent, sludge, fumes, etc., from industrial operations. Calorie (BTU) values must be determined for the individual materials to be destroyed.

(g) Type 6. Solid by-product waste, such as rubber, plastic, wood waste, etc., from industrial operations. Calorie (BTU) values shall be determined for the individual materials to be destroyed.

(h) Type 7-Municipal sewage sludge waste, residue generated from the processing of raw sludge from a treatment plant.

1201.02 *Classification of Incinerators (Class I-VIII) Defined by the Incinerator Institute of American Standards.* Classifications shall be as follows:

(a) Class I — Portable, packaged, completely assembled, direct fed incinerators, having not over 0.142 cubic meters (5 cubic feet) storage capacity or 11.34 kilograms (25 pounds) per hour burning capacity and suitable for Type 2 waste.

(b) Class IA — Portable, packaged or job assembled, direct fed incinerator 0.142 to 0.426 cubic meters (5 to 15 cubic feet) primary chamber volume; or a burning rate of 11.34 kilograms (25 pounds) per hour up to, but not including, 34.02 kilograms (75 pounds) per hour of Type 3 waste.

(c) Class II — Flue-fed, single chamber incinerators with more than 0.186 square meters (2 square feet) burning area, suitable for Type 2 waste. This type of incinerator is served by one vertical flue functioning both as a chute for charging waste and to carry the products of combustion to the atmosphere.

(d) Class IIA — Chute fed, multiple chamber incinerators with more than 0.186 square meters (2 square feet) burning area, suitable for Type 1 (non-industrial) or Type 2 waste. This type of incinerator is served by a vertical chute for charging wastes from two or more floors above the incinerator and a separate flue for carrying the products of combustion to the atmosphere.

(e) Class III — Direct fed incinerators with a burning rate of 46.40 kilograms (100 pounds) per hour or over, suitable for Type O, Type 1 or Type 2 waste.

(f) Class IV — Direct fed incinerators with a burning rate of 34.02 kilograms (75 pounds) per hour or over, suitable for Type 3 waste.

(g) Class V — Municipal incinerators suitable for Type O, Type 1, Type 2 or Type 3 wastes or a combination of all four wastes and are rated in kilograms (tons) per hour or kilograms (tons) per 24 hours.

(h) Class VI — Crematory and pathological incinerators Type 4 waste.

(i) Class VII — Incinerators designed for specific by-product wastes, Type 5 or 6.

(j) Class VIII — Municipal sewage sludge incinerators suitable for Type 7 waste.

1201.03 *Agency Approval of New Methods and Incinerator Designs.*

(a) Nothing in Air 1201 shall be interpreted as prohibiting the agency from approving the construction of any incinerator which shall introduce:

(1) New methods which may improve upon combustion and reduce air pollution.

(2) New design and engineering features which may improve upon combustion and reduce air pollution.

1201.04 *Visible Emission Standard for Incinerators.* There shall not be discharged into the ambient air from incinerator any air pollutant for a period or periods

NEW JERSEY

NEW JERSEY REGULATIONS ON DIESEL-POWERED MOTOR VEHICLES

(New Jersey Administrative Code, Title 7, Chapter 27 — Bureau of Air Pollution Control, Subchapter 14 — Diesel Smoke; Adopted December 21, 1970, Effective June 18, 1971; Amended December 28, 1984, Effective January 21, 1985; November 4, 1985, Effective December 2, 1985)

7:27-14.1 Definitions

The following words and terms, when used in this Subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Autobus" indicates all motor vehicles used for the transportation of passengers for hire.

"Department" means the Department of Environmental Protection.

"Diesel-powered engine" means a mechanism for converting energy into mechanical force and motion by using a compression ignition type of internal combustion engine.

"Diesel-powered motor vehicle" means a vehicle which is self-propelled by a compression ignition type of internal combustion engine and which is designed primarily for transporting persons or property on a public street or highway; for purposes of this Subchapter, passenger automobiles and motorcycles are excluded.

"Exhaust emissions" means substances emitted into the atmosphere from any opening downstream from the exhaust ports of a motor vehicle engine.

" Idle" means the motor vehicle operating mode consisting of a non-loaded, throttled engine speed at the revolutions per minute specified by the manufacturer.

"Motor vehicle" means all vehicles propelled otherwise than by muscular power, excepting motorized bicycles and such vehicles as run only upon rails or tracks.

"Opacity" means the property of a substance which renders it partially or wholly obstructive to the transmission of visible light expressed as the percentage to which the light is obstructed.

"Persons" means corporations, companies, associations, societies, firms, partnerships and joint stock companies as well as individuals, and shall also include all political subdivisions of this State or any agencies or instrumentalities thereof.

"Smoke" means small gasborne and airborne particles, exclusive of vapor, arising from a process of combustion in sufficient number to be observable.

7:27-14.2 Inspection standard

(a) Any motor vehicle propelled by a diesel-powered engine which is subject to inspection by the owner or lessee at the premises or places of business of the owner or lessee as required by the Division of Motor Vehicles as a condition of compliance with said inspection shall not emit smoke in the exhaust emissions in excess of the 20 percent smoke opacity standard as determined according to the inspection procedure established at N.J.A.C. 7:27B-4.3.

(b) Any diesel-powered autobus which is subject to the inspection rules and regulations of the New Jersey Department of Transportation (reference N.J.S.A. 48:4, and N.J.A.C. 16:53) as a condition of compliance with said inspection shall not emit smoke in the exhaust emissions in excess of the 12 percent smoke opacity standards as determined according to the inspection procedure established at N.J.A.C. 7:27B-4.4.

7:27-14.3 Idle standard

(a) No person shall cause, suffer, allow, or permit the engine of a diesel-powered motor vehicle to idle for more than three consecutive minutes if the vehicle is not in motion, except

1. A motor vehicle at the vehicle operator's place of business where the motor vehicle is permanently assigned may idle for 30 consecutive minutes; or

2. A motor vehicle may idle for 15 consecutive minutes when the vehicle engine has been stopped for three or more hours.

(b) The provisions of (a) above shall not apply to:

1. Autobuses while discharging or picking up passengers;

2. Motor vehicles stopped in a line of traffic;

3. Motor vehicles whose primary and/or secondary power source is utilized in whole or in part for necessary and definitively prescribed mechanical operation other than propulsion, passenger compartment heating or air conditioning;

4. Motor vehicles being or waiting to be examined by State of Federal motor vehicle inspectors;

5. Emergency motor vehicles in an emergency situation;

6. Motor vehicles while being repaired;

7. Motor vehicles while engaged in the process of connection, detachment or exchange of trailers; or

8. Motor vehicles manufactured with a sleeper berth while being used, in a nonresidentially zoned area, by the vehicle's operator for sleeping or resting.

NEW JERSEY LIGHT-DUTY MOTOR VEHICLE REGULATIONS

(New Jersey Administrative Code, Title 7, Chapter 27 — Bureau of Air Pollution Control, Subchapter 15 — Control and Prohibition of Air Pollution from Light-Duty Gasoline-Fueled Motor Vehicles; Adopted January 6, 1972; Amended June 22, 1973; June 28, 1974, Effective July 1, 1974; January 31, 1975; April 1, 1975; January 14, 1976; January 3, 1977; November 2, 1983; December 28, 1984, Effective January 21, 1985; June 5, 1985, Effective July 5, 1985; November 4, 1985, Effective December 2, 1985)

OFFICE OF ADMINISTRATIVE LAW NOTE: On June 30, 1983, Governor Thomas Kean signed into law New Jersey Senate Bill No. 3472, amending N.J.S.A. 39:8-1, 39:3-2 and P.L. 1975, c. 156 and supplementing Title 39 of the Revised Statutes. The amended law permits the Director, Division of Motor Vehicles, to designate licensed reinspection centers as official inspection stations for a temporary period of time. Unless there is an extension of the program, it will expire June 1, 1984, and all licensed official inspection stations will revert back to the designation of reinspection centers.

Among the provisions of the amendments to the statute is a requirement that within 90 days of the effective date, the Department of Environmental Protection shall adopt standards for the certification of vehicle emission testing equipment used by private garages licensed after May 1, 1983. Private garages which have been licensed by the Director, Division of Motor Vehicles, prior to May 1, 1983 will not be required to comply with the standards until May 1, 1985. These standards shall include, but not be limited to, the following:

1. An automated system to control test sequencing, the automatic pass or fail decision, and the format for the test report and recorded magnetic tape file;
2. An exhaust gas analysis portion;
3. A device to accept and record vehicle identification information; and
4. A device to provide a printed record of the test results to the consumer.

The Department rule concerning Control and Prohibition of Air Pollution from Light-Duty Gasoline-Fueled Motor Vehicles, N.J.A.C. 7:27-15.1, establishes the definition for "approved exhaust gas analytical system" as a requirement for performing either emission inspections at State-operated inspection stations or emission reinspections at private licensed reinspection centers. N.J.A.C. 7:27-15.1 provides that system specifications for these analyzers be kept on file with the Department.

On September 2, 1983 the standards referenced at N.J.A.C. 7:27-15.1 were adopted by the Department of Environmental Protection on an emergency basis as R.1983 d.407. On November 2, 1983 they were readopted without change as R.1983 d.536, and are exempt from the expiration provisions of Executive Order 66(1978) since the application of this order would be in violation of the Clean Air Act, as amended August 1977 (42 USC 7401 et seq.). See: 15 N.J.R. 1607(a), 15 N.J.R. 1943(b).

The "Specifications for Exhaust Gas Analytical System" can be obtained from the Division of Environmental Quality, 380 Scotch Road, Trenton, NJ 08628.

7:27-15.1 Definitions

The following words and terms when used in this Subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Approved exhaust gas analytical system" means a device for sensing the amount of air contaminants in the exhaust emissions of a motor vehicle. For purposes of this Subchapter, this shall mean analyzing devices of the nondispersive infrared type sensitized to measure carbon monoxide at the 4.74 micron band expressed as percent carbon monoxide in air and to measure hydrocarbons as hexane at the 3.41 micron band expressed as parts per million of hydrocarbons (hexane) in air. The device shall be approved by the Department as one which is in accordance with specifications contained in "Specifications For Exhaust Gas Analytical System For Use By

New Jersey Division of Motor Vehicles Private Inspection Centers (PIC)" or "Specifications For Exhaust Gas Analytical System For Use By New Jersey Division of Motor Vehicles Operated Official Inspection Stations" and shall be used in accordance with the manufacturer's recommended procedures for calibration and maintenance.

"Carbon monoxide (CO)" means colorless, odorless, tasteless gas at standard conditions having a molecular composition of one carbon atom and one oxygen atom.

"Commissioner" means the Commissioner of the Department of Environmental Protection.

"Crankcase emissions" means substances emitted into the atmosphere from any portion of the engine crankcase ventilation or lubrication system.

"Department" means the Department of Environmental Protection.

"Emission control apparatus" means any device employed by the vehicle manufacturer which prevents or controls the emission of any air contaminant, including associated components which monitor the function and maintenance of these devices.

"Exhaust emissions" means substances emitted into the atmosphere from any opening downstream from the exhaust ports of a motor vehicle engine.

"Gasoline-fueled motor vehicle" means any motor vehicle equipped to be powered by a hydrocarbon fuel other than diesel fuel, but including alcohol fuels and hydrocarbon-alcohol fuel blends.

"Heavy-duty motor vehicle" means any motor vehicle designed primarily for transportation of persons or property and registered as exceeding 6,000 pounds gross weight.

'Hydrocarbons (HC)" means compounds whose molecules consist of atoms of hydrogen and carbon only.

"Light-duty motor vehicle" means any motor vehicle designed primarily for transportation of persons or property and registered at 6,000 pounds gross weight or less.

"Model year of vehicle" means the production period of new motor vehicles or new motor vehicle engines designated by the calendar year in which such period ends. If the manufacturer does not designate a production period, the model year with respect to such vehicles or engines shall mean the 12-month period beginning January of the year in which production begins.

"Motor vehicle" means all vehicles propelled otherwise than by muscular power, excepting motorized bicycles and such vehicles as run only upon rails or tracks.

"Motorized bicycle" means a pedal bicycle having a helper motor characterized in that either the maximum piston displacement is less than 50 cubic centimeters or said motor is rated at no more than 1.5 brake horsepower and said bicycle is capable of a maximum speed of no more than 25 miles per hour on a flat surface.

"New motor vehicle" means a newly manufactured motor vehicle registered in New Jersey, prior to delivery to the ultimate purchaser.

"New motor vehicle dealer" means any person licensed pursuant to N.J.S.A. 39:10-19 to sell new motor vehicles.

"Person" means corporations, companies, associations, societies, firms, partnerships and joint stock companies as well as individuals, and shall also include all political subdivisions of this State or any agencies or instrumentalities thereof.

"Pre-delivery checklist" means a schedule of items and procedures which a new motor vehicle dealer is required or requested by a manufacturer to check or follow prior to delivery of a new motor vehicle to the ultimate purchaser.

"Smoke" means small gasborne and airborne particles, exclusive of water vapor, arising from a process of combustion in sufficient number to be observable.

"Ultimate purchaser" means any person, other than a motor vehicle dealer purchasing in his capacity as a motor vehicle dealer, who in good faith purchases a motor vehicle for purposes other than for resale as a motor vehicle dealer.

7:27-15.2 Public highway standard

(a) No person shall cause, suffer, allow or permit the operation of any gasoline-fueled motor vehicle upon the public highways of the State if the vehicle emits visible smoke in the exhaust emissions or in the crankcase emissions for a period in excess of three consecutive seconds.

(b) No person shall cause, suffer, allow or permit the operation of any gasoline-fueled motor vehicle upon the public highways of the State if the vehicle emits hydrocarbons (HC) or carbon monoxide (CO) in the exhaust emissions in excess of standards as set forth in Table 1 when measured using an approved exhaust gas analytical system and the inspection test procedure established at N.J.A.C. 7:27B-4.5.

7:27-15.3 New motor vehicle dealer inspection compliance standard

(a) Any gasoline-fueled new motor vehicle subject to inspection by any new motor vehicle dealer in accordance with regulations promulgated by the New Jersey Division of Motor Vehicles shall, prior to delivery by the new motor vehicle dealer to the ultimate purchaser, conform to the emission specifications prescribed by the manufacturer and/or such specifications as may be prescribed by the manufacturer in the new motor vehicle predelivery check list to assure proper functioning of the vehicle emission control apparatus.

(b) Whenever emission specifications are not prescribed, the inspection standards as set forth in N.J.A.C. 7:27-15.4(b) shall apply to such new motor vehicles.

7:27-15.4 Motor vehicle inspection standards

(a) Any light-duty or heavy-duty gasoline-fueled motor vehicle which is subject to inspection by the State of New Jersey in accordance with the provisions of N.J.S.A. 39:8, as a condition of compliance with said inspection, shall not emit visible smoke in the exhaust emissions or in the crankcase emissions for a period in excess of three consecutive seconds when undergoing the inspection test procedure established at N.J.A.C. 7:27B-4.5.

(b) Any light-duty or heavy-duty, gasoline-fueled motor vehicle which is subject to inspection by the State of New Jersey in accordance with the provisions of N.J.S.A. 39:8, as a condition of compliance with said inspection, shall not emit carbon monoxide (CO) or hydrocarbons (HC) in the exhaust emissions in excess of standards set forth in Table 1, when measured using an approved exhaust gas analytical system and the inspection test procedure established at N.J.A.C. 7:27B-4.5.

(c) Any post-1974 model year gasoline-fueled motor vehicle weighing less than 8501 pounds which is subject to inspection by the State of New Jersey in accordance with the provisions of N.J.S.A. 39:8, as a condition of compliance with said inspection, shall have properly functioning and properly maintained emission control apparatus as determined according to the inspection test procedure established at N.J.A.C. 7:27B-4.6.

TABLE 1 — EXHAUST EMISSION STANDARDS FOR GASOLINE-FUELED MOTOR VEHICLES SUBJECT TO INSPECTION BY THE STATE OF NEW JERSEY

Light-Duty, Gasoline-Fueled Moter Vehicles

MODEL YEAR	IDLE CO (%)	IDLE HC (ppm as hexane)
Pre-1968	8.5	1400
1968-1970	7.0	700
1971-1974	5.0	500
1975-1980	3.0	300
1981 & Later	1.2	220

Heavy-Duty, Gasoline-Fueled Motor Vehicles

MODEL YEAR	IDLE CO (%)	IDLE HC (ppm as hexane)
Pre-1968	8.5	1400
1968-1970	8.5	1200
1971-1974	6.0	700
1975-1978	4.0	500
1979 & Later	3.0	300

7:27-15.5 Operation of emission control apparatus

(a) No person shall cause, suffer, allow or permit any emission control apparatus installed on any motor vehicle to be disconnected, detached, deactivated, or in any other way rendered inoperable or less effective than designed by the original equipment manufacturer (except temporarily for the purpose of diagnosis, maintenance, repair or replacement).

(b) No person shall cause, suffer, allow or permit the operation on the public highways of any motor vehicle in which emission control apparatus installed on such vehicle has been disconnected, detached, deactivated, or in any other way rendered inoperable or less effective than designed by the original equipment manufacturer.

(c) No person shall cause, suffer, allow or permit the sale of any motor vehicle in which emission control apparatus installed on such vehicle has been disconnected, detached, deactivated, or in any other way rendered inoperable or less effective than designed by the original equipment manufacturer.

7:27-15.6 Idle standard

(a) No person shall cause, suffer, allow or permit the engine of a diesel-powered motor vehicle to idle for more than three consecutive minutes if the vehicle is not in motion except:

1. A motor vehicle at the vehicle operator's place of business where the motor vehicle is permanently assigned may idle for 30 consecutive minutes; or

2. A motor vehicle may idle for 15 consecutive minutes when the vehicle engine has been stopped for three or more hours.

(b) The provisions of (a) above shall not apply to:

1. Autobuses while discharging or picking up passengers;

2. Motor vehicles stopped in a line of traffic;

3. Motor vehicles whose primary and/or secondary power source is utilized in whole or in part for necessary

and definitively prescribed mechanical operation other than propulsion, passenger compartment heating or air conditioning;

4. Motor vehicles being or waiting to be examined by State or Federal motor vehicle inspectors;

5. Emergency motor vehicles in an emergency situation;

6. Motor vehicles while being repaired;

7. Motor vehicles while engaged in the process of connection, detachment or exchange of trailers; or

8. Motor vehicles manufactured with a sleeper berth while being used, in a non-residentially zoned area, by the vehicles operator for sleeping or resting.

7:27-15.7 Exceptions

(a) This Subchapter shall not apply to motorcycles or to motor vehicles with an engine displacement of less than 50 cubic inches (819 cubic centimeters).

(b) Nothing in this Subchapter is intended to limit or deny the inspection of motor vehicles for exhaust systems in accordance with regulations established pursuant to N.J.S.A. 39:8-1, 39:8-2, 39:3-70, 39:3-76, and 39:10-26.

7:27-15.8 Variances

Whenever either the Commissioner or the Director, Division of Motor Vehicles, has reason to believe that any vehicle or any vehicle class cannot comply with the provisions of N.J.A.C. 7:27-15.4(b), the Director, with the concurrence of the Commissioner, may prescribe alternative emission inspections standards for such vehicle or vehicle class.

NEW JERSEY TESTING PROCEDURES FOR MOTOR VEHICLES

(New Jersey Administrative Code, Title 7, Chapter 27B—Sampling and Analytical Procedures, Subchapter 4—Air Test Method 4: Testing Procedures for Motor Vehicles; Adopted December 28, 1984, Effective January 21, 1985; Amended June 5, 1985, Effective July 1, 1985)

7:27B-4.1 Definitions

The following words and terms, when used in this Subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Autobus" includes all motor vehicles used for the transportation of passengers for hire.

"Carbon monoxide (CO)" means a colorless, odorless, tasteless gas at standard conditions having a molecular composition of one carbon atom and one oxygen atom.

"Chassis dynamometer" means a device constructed in such manner as a simulate highway driving conditions on a stationary motor vehicle.

"Commissioner" means the Commissioner of the Department of Environmental Protection.

"Crankcase emissions" means substances emitted into the atmosphere from any portion of the engine crankcase ventilation or lubrication system.

"Department" means the Department of Environmental Protection.

"Diesel-powered motor vehicle" means a vehicle which is self-propelled by a compression ignition type of internal combustion engine and which is designed primarily for transporting persons or property on public streets or highways; for purposes of this Subchapter, passenger automobiles and motorcycles are excluded.

"Emission control apparatus" means any device employed by the vehicle manufacturer which prevents or controls the emission of any air contaminant, including associated components which monitor the function and maintenance of these devices.

"Exhaust emissions" means substances emitted into the atmosphere from any opening downstream from the exhaust ports of a motor vehicle engine.

"Exhaust leak" means any condition of the exhaust system which permits exhaust emissions to escape into the atmosphere at any point between the exhaust ports of a motor vehicle engine and the outlet of the engine exhaust pipe.

"Gasoline-fueled motor vehicle" means any motor vehicle equipped to be powered by a hydrocarbon fuel other than diesel fuel, but including alcohol fuels and hydrocarbon-alcohol fuel blends.

"Heavy-duty motor vehicle" means any motor vehicle designed primarily for transportation of persons or property and registered as exceeding 6,000 pounds gross weight.

"Hydrocarbons (HC)" means compounds whose molecules consist of atoms of hydrogen and carbon only.

"Idle mode" means the vehicle test mode of the prescribed inspection test procedure, consisting of a non-loaded, throttled engine speed at the revolutions per minute specified by the manufacturer.

"Inspector" means any person authorized by the State of New Jersey to enforce N.J.A.C. 7:27-14.2.

"Light-duty motor vehicle" means any motor vehicle designed primarily for transportation of persons or property and registered at 6,000 pounds gross weight or less.

"Motor vehicle" means all vehicles propelled otherwise than by muscular power, excepting motorized bicycles and such vehicles as run only upon rails or tracks.

"Motor vehicle safety specialist" means any person employed by the New Jersey Division of Motor Vehicles to enforce motor vehicle safety and emission test standards.

"Motorized bicycle" means a pedal bicycle having a helper motor characterized in that either the maximum piston displacement is less than 50 cubic centimeters, or said motor is rated at no more than 1.5 brake horsepower and said bicycle is capable of a maximum speed of no more than 25 miles per hour on a flat surface.

"MPH" means miles per hour.

"Opacity" means the property of a substance which renders it partially or wholly obstructive to the transmission of visible light expressed as the percentage to which the light is obstructed.

"Operating mode" means a procedure for operating a diesel-powered motor vehicle or a diesel-powered engine during measurement of smoke opacity in the exhaust emissions.

"Prescribed inspection test procedure" means a method prescribed by the Department for testing exhaust emissions from light and heavy-duty motor vehicles.

"RPM" means revolutions per minute.

"Smoke" means small gasborne and airborne particles, exclusive of water vapor, arising from a process of combustion in sufficient number to be observable.

"Smokemeter" means a device constructed in such a manner as to measure smoke opacity by light obstruction between a light source and photoelectric cell which will indicate the percent of opacity of smoke at a point approximately six inches from the engine exhaust outlet. The device shall be of design meeting "Specifications For A Smoke Opacity Meter" dated April 30, 1981, and on file with the Commissioner and approved for use in accordance with manufacturer's recommended procedures for calibration, mounting and maintenance.

7:27B-4.2. General instructions for all tests

(a) The inspector shall insure prior to each test that the test equipment is calibrated by checking and, if necessary, adjusting zero and span settings.

(b) All measurements are to be made after the engine is at normal operating temperature.

(c) Any vehicle found to exhibit an exhaust leak shall have said leak repaired before an approved test can be performed.

(d) Standard application of the smoke opacity test procedures is required on exhaust outlets on vehicles equipped with dual, adjacent exhaust outlets.

7:27B-4.3 Smoke opacity testing procedures for diesel-powered motor vehicles subject to the inspection rules and regulations of the New Jersey Division of Motor Vehicles

(a) The smoke opacity testing procedures for diesel-powered motor vehicles subject to self-inspection authorized by the Division of Motor Vehicles at the premises or places of business of the owner or lessee to determine compliance with N.J.A.C. 7:27-14.2(a), are as follows:

1. The vehicle driver on chassis dynamometer with simulated load by power absorption procedure requires that the smokemeter be firmly positioned on the exhaust outlet and that the vehicle be positioned on the chassis dynamometer before the inspector proceeds with the following steps:

i. With vehicle on a chassis dynamometer under no power absorption, select a gear ratio which will produce a maximum vehicle speed of 45-60 MPH at governed engine RPM;

ii. With engine running at governed engine RPM, apply power absorption load to the dynamometer until such loading reduces the engine RPM to 80 percent of the governed speed, the peak smoke opacity measured over a period of five to ten seconds with the engine under such loading shall be the smoke opacity.

2. The vehicle driven in low gear with simulated load by braking action procedure requires that the smokemeter be firmly positioned on the exhaust outlet before proceeding with the following steps:

i. Select a gear ratio which will produce a maximum speed of 10-15 MPH, at governed engine RPM, drive vehicle at 10-15 MPH at governed engine RPM;

ii. Load the engine by applying brakes until engine RPM is lugged down at 80 percent of the governed engine RPM, the peak smoke opacity measured over a period of 5-10 seconds with the engine under such brake loading shall be the smoke opacity.

7:27B-4.4 Smoke opacity testing procedure for diesel-powered autobuses subject to the inspection rules and regulations of the New Jersey Department of Transportation

(a) The smoke opacity testing procedure for diesel-powered autobuses subject to the inspection rules and regulations of the Department of Transportation to determine compliance with N.J.A.C. 7:27-14.2(b) shall be the following:

1. Position smokemeter against exhaust outlet using extension pole and magnet so that the optical axis of the sensor head is perpendicular to the smoke plume;

2. With engine at normal operating temperature, depress accelerator pedal slowly to obtain a fast idle (1200-1300 RPM);

3. Accelerate the engine from fast idle to maximum governed RPM by depressing the accelerator pedal as rapidly as possible;

4. As governed RPM is reached, release the accelerator pedal to allow engine to coast down to fast idle (1200-1300 RPM);

5. Repeat steps 3 and 4; (NOTE: Steps 3, 4, and 5 are to purge the engine.)

6. After the engine purge, repeat steps 3 and 4 three times in succession. After each successive measurement, record peak opacity reading and reset smokemeter. The average of the three peak smoke opacity measurements obtained with the smokemeter shall be the test result as measured using the standing acceleration test procedure.

7:27B-4.5 Exhaust emission testing procedure for gasoline-fueled motor vehicles subject to inspection by the State of New Jersey

(a) The exhaust emission testing procedure for gasoline-fueled motor vehicles to determine compliance with N.J.A.C. 7:27-15.2(b), and 15.4(a) and (b) shall be the following:

1. The smoke test shall be performed as follows:

i. Place the vehicle in neutral gear with all accessories off and the handbrake secured;

ii. Accelerate the engine and observe for visible continuous smoke in the exhaust emissions and crankcase emissions;

iii. Visible smoke in the exhaust emissions or crankcase emissions for a period in excess of three consecutive seconds shall be a cause for rejection.

2. The emissions test at idle mode shall be performed as follows:

i. Engines shall be at normal operating temperature and not overheating (as indicated by gauge warning light or boiling radiator) with all accessories off;

ii. With engine operating in the idle mode and transmission in neutral, the sample probe shall be inserted at least six inches into the exhaust outlet;

iii. Record exhaust concentrations measured as percent carbon monoxide and parts per million hydrocarbons after stabilized readings are obtained or at the end of 30 seconds, whichever occurs first;

iv. These exhaust concentrations shall be the inspection test results.

7:27B-4.6 Gasoline-fueled motor vehicle emission control apparatus compliance examination procedure

(a) The examination of the motor vehicle emission control apparatus of all post-1974 model year gasoline-fueled motor vehicles under 8501 pounds to determine compliance with N.J.A.C. 7:27-15.4(c), when conducted during annual inspection and random roadside inspection, shall consist of the following three examinations:

1. A visual check to determine the presence of properly installed catalytic converters on motor vehicles designed and marketed by the vehicle manufacturer with catalytic converters as original equipment. The absence of such properly installed catalytic converters, shall be cause for vehicle rejection. Rejected vehicles shall be required to be properly equipped with new or used replacement catalytic converters certified according to U.S. Environmental Protection Agency procedures and subsequently reexamined. The reexamination shall consist of a visual check to document proper installation of a new replacement catalytic converter.

2. Reserved.

3. An examination consisting of a visual inspection for the presence of, or malfunction of the fuel filler neck inlet restrictor on motor vehicles designed and marketed by the vehicle manufacturer for operation with unleaded fuel only. Rejected vehicles shall be required to be properly equipped with new or used replacement catalytic converters certified according to U.S. Environmental Protection Agency procedures and a new fuel filler neck inlet restrictor. Reexamination shall consist of a visual check to document proper installation of a replacement catalytic converter and fuel filler neck inlet restrictor.

i. The fuel filler neck inlet restrictor examination shall be conducted in the following manner:

(1) Attempt to insert a dowel, with a diameter equivalent to that of a standard leaded fuel pump nozzle, into the fuel filler neck;

(2) The absence of the fuel filler neck inlet restrictor is verified if the dowel can be inserted and shall be cause for vehicle rejection;

(b) Inspection of gasoline-fueled motor vehicles for (a) above shall be implemented by model year and registered weight in accordance with the following schedule:

Date	Model Year	Registered Weight
December 1, 1985	1985 and later	Under 6001 pounds
May 1, 1986	1982 and later	Under 6001 pounds
July 1, 1986	1982 and later	Under 8501 pounds
January 1, 1987	1979 and later	Under 8501 pounds
May 1, 1987	1975 and later	Under 8501 pounds

7:27B-4.7 Gasoline-fueled motor vehicle exhaust lead determination procedure

(a) An examination using lead test paper to determine the presence of lead in the vehicle exhaust shall be performed on the following vehicles:

1. All post-1974 model year gasoline-fueled motor vehicles weighing less than 8501 pounds which are designed and marketed by the vehicle manufacturer for operation with unleaded fuel only and which are determined during annual inspection and random roadside inspection to have improperly functioning or improperly maintained emission control apparatus as determined according to the inspection test procedure established at N.J.A.C. 7:27B-4.6.

2. One percent of all post-1974 model year gasoline-fueled motor vehicles weighing less than 8501 pounds which are designed and marketed by the vehicle manufacturer for operation with unleaded fuel only and which are determined during annual inspection and random roadside inspection to have properly functioning and properly maintained emission control apparatus as determined according to the inspection test procedure established at N.J.A.C. 7:27B-4.6.

(b) The lead test paper examination shall be conducted in the following manner:

1. Remove test paper from package and moisten with distilled water;

2. Wipe a small section of the tailpipe with a cloth;

3. Attach moistened paper onto the cleaned surface of the tailpipe with a clip; and

4. Remove paper.

5. The presence of lead in the vehicle exhaust is indicated by the lead paper changing to a pink or red color.

(c) The test results for vehicles examined according to the inspection test procedure established at (b) above shall be recorded by the New Jersey Division of Motor Vehicles and forwarded monthly to the Department of Environmental Protection.

(d) The presence of lead in the vehicle exhaust, if determined solely according to the inspection test procedure established at (b) above shall not be cause for vehicle rejection.

(e) This section shall not apply to vehicle examinations performed by private inspection centers licensed by the Division of Motor Vehicles.

(f) This section shall expire on October 1, 1986.

NEW MEXICO

NEW MEXICO MOTOR VEHICLE INSPECTION RULES

(New Mexico Environmental Improvement Division; Air Quality Control Regulation Section 28 — Motor Vehicle Inspection; Adopted September 10, 1980)

28.01 Policy and legal authority

A. These Rules and Regulations are adopted pursuant to the authority granted by the City of Albuquerque and Bernalillo County Motor Vehicle Emissions Control Ordinances.

B. The intent of these Regulations is to control the release into the atmosphere of air contaminants from motor vehicles in a manner that insures the health, safety, and general welfare of all the citizens of the City of Albuquerque and Bernalillo County.

28.02 Definitions

In these Regulations, unless the context otherwise requires:

1. "Approved CO/HC Emission Analyzer" means a garage-type NDIR CO/HC emission analyzer which meets the specifications indicated in the MVIP procedures manual.

2. "AQCB" means the Albuquerque-Bernalillo County Air Quality Control Board.

3. "Certificate of compliance" means a serially numbered document issued by the referee facility, fleet or official emissions inspection station at the time of inspection indicating that the vehicle has met the emissions standards.

4. "Certificate of exemption" means a serially numbered document issued by the MVIP indicating that the vehicle is exempt from the mandatory vehicle inspection.

5. "Certificate of waiver" means a serially numbered document indicating that the requirement of passing reinspection has been waived for a vehicle pursuant to Sections 7-C of the City of Albuquerque and Bernalillo County Motor Vehicle Emissions Control Ordinances.

6. "Constant four-wheel drive vehicle" means any four-wheel drive vehicle with four wheels which cannot be converted to two-wheel drive except by disconnecting one of the vehicle's drive shafts.

7. "Cruise modes" are loaded driving conditions that are simulated on a chassis dynamometer.

8. "Dealer" means a person or organization licensed by the New Mexico Department of Transportation, Motor Vehicle Division as a new motor vehicle dealer and/or used motor vehicle dealer.

9. "Emissions inspection station permit" means a certificate issued by the Program Manager authorizing the holder to perform vehicular inspections pursuant to these Regulations.

10. "Exhaust emissions" means products of combustion emitted into the atmosphere from any opening downstream of the exhaust port(s) of a motor vehicle engine.

11. "Fast idle mode test" means an unloaded exhaust emissions test conducted at 2250 to 2500 RPM as described in the MVIP Procedures Manual.

12. "Field calibration gas" means a gas with known concentrations of CO and HC that is used by an MVIP inspector to check the accuracy of emissions analyzers used by official emissions inspection stations, and fleet stations.

13. "Fleet emissions inspection station" means any inspection facility operated under a permit issued pursuant to Section 28.13 of these regulations.

14. "Fleet inspection sticker" means a serially numbered document issued by a fleet emissions inspection station at the time of inspection indicating that the vehicle has met the emissions standards.

15. "Fuel" means any material that is burned within the confines of a vehicle in order to be used as the means of propelling the vehicle.

16. "Governmental vehicle" means a registered motor vehicle exempt from the payment of a registration fee owned or leased by any federal, state, local, or other governmental entity.

17. " Idle mode test" means an unloaded exhaust emissions test conducted only at the idle condition, as described in the MVIP Procedures Manual.

18. "Independent contractor" means any person, business firm, partnership or corporation with whom the City of Albuquerque has entered into a contract which provides for the construction, equipping, maintenance, personnel, management and operation of official emissions inspection stations.

19. "Inspection" means the mandatory vehicular emissions inspection.

20. "Inspection sticker" means a self-adhesive, serially numbered sticker indicating "pass," "fail," "waiver," or "exempt."

21. "Loaded mode test" means an exhaust emissions test sequence conducted at the idle, low and/or high cruise test conditions as described in the MVIP Procedures Manual.

22. "Manufacturer's Statement of Origin (MSO)" means a statement on a form supplied by or approved by the New Mexico Department of Transportation, Motor Vehicle Division, signed by the manufacturer that the new vehicle described therein has been transferred to the New Mexico dealer named therein or to a dealer duly licensed or recognized as such in another state, territory, or possession of the United States, and that such transfer is the first transfer of such vehicle in ordinary trade and commerce.

23. "Model year" means either (1) the annual production period of a motor vehicle as designated by the calendar year in which such period ends, (2) the date of actual manufacture, or (3) in the case of any vehicle manufactured in two or more stages, the year of completion of the chassis.

24. "Motor vehicle" means any self-propelled, gasoline-fueled or gasoline-mixed fueled vehicle with four or more wheels in contact with the ground and weighing [1000] lbs. ([453]Kg.) or more but less than [8001] lbs. ([3629]Kg.) gross vehicle weight, and built on a chassis having a rated capacity of less than one (1) ton, registered or to be registered in this State and used upon the public highways of Bernalillo County for the purpose of transporting persons or property.

25. "MVIP" means the Motor Vehicle Inspection Program Section of the Air Pollution Control Division for the City of Albuquerque.

26. "MVIP Procedures Manual" means a compilation of procedures developed by the Program Manager, and approved by the AQCB, which specifies the methods to be used by the independent contractors and fleet emission inspection stations in the inspection of motor vehicles.

27. "New Motor Vehicle" is a vehicle which has been registered for the first time from a manufacturer's statement of origin (MSO).

28. "Official emissions inspection station" means an inspection facility, operated by the independent contractor, whether placed in a permanent structure or in a mobile unit for conveyance among various locations within Bernalillo County, for the purposes of conducting inspections of vehicles required to be inspected pursuant to these Regulations.

29. "Program" means the Motor Vehicle Inspection Program.

30. "Program Manager" means the manager of the Motor Vehicle Inspection Program.

31. "Reconstructed vehicle" means either of the following:

a. A vehicle identified as a reconstructed vehicle on the portion of the vehicle's New Mexico registration card or New Mexico certificate of title that is reserved for identification of the vehicle's style.

b. When the vehicle style is not shown on the New Mexico registration card or certificate of title, the vehicle shall be considered to be a reconstructed vehicle if the original manufacturer of the complete vehicle cannot be identified from the body.

32. "Referee Facility" means an emissions inspection facility operated by the Motor Vehicle Inspection Program for the purpose of evaluating waiver applications and to provide for mediation of disputes arising from inspection activities.

33. "Standard gases" means National Bureau of Standards certified samples of gases maintained as primary standards for determining the composition of working gases, field calibration gases, or the accuracy of analyzers.

34. "Vehicular emissions inspector" means an individual inspector employed by the independent contractor or MVIP to perform vehicle emission inspections for the program.

35. "Vehicular emissions mechanic" means a person who is qualified by training and experience to diagnose, maintain and repair emission systems and related engine systems on fleet vehicles.

36. "Working gases" means gases maintained by a facility to perform periodic calibration of emission analyzers.

37. Abbreviations and symbols used herein shall be as follows:

a. A/F means air/fuel
b. CO means carbon monoxide
c. GVW means gross vehicle weight
d. HC means hydrocarbon
e. HP means horsepower
f. LNG means liquified natural gas
g. LPG means liquid petroleum gas
h. MPH means miles per hour
i. MVD means the Motor Vehicle Division of the New Mexico Department of Transportation
j. NDIR means non-dispersive infra-red
k. % means percent
l. PCV means positive crankcase ventilation
m. PPM means parts per million by volume
n. VIN means vehicle identification number

28.03 Motor vehicles to be inspected by the motor vehicle inspection program

All motor vehicles to be registered or re-registered in Bernalillo County for highway use shall be inspected annually in accordance with these Regulations at an official emissions inspection station or at a fleet emissions inspection station except for the following:

1. Motor vehicles whose model year is 1967 or before.

2. Motor vehicles with engine displacements less than 800 cubic centimeters (48.81 cu. in.).

3. New motor vehicles registered for the first time from a manufacturer's statement of origin (MSO).

4. Motor vehicles that are used for legally sanctioned competition and not operated on public streets and highways.

5. Implements of farming or husbandry, or road machinery operated temporarily on public streets and highways.

6. All motor vehicles fueled only by LNG or LPG.

28.04 Inspection requirements and procedures

A. All vehicles required to be inspected by these Regulations shall pass inspection by meeting the requirements of 28.06 unless waived pursuant to 28.08.

B. The Program Manager shall develop an MVIP Procedures Manual which indicates specifications and methods to be used by the independent contractor, fleet emission inspection stations and the MVIP in the inspection of motor vehicles, and by the automotive repair industry in the repairing of motor vehicles.

C. The MVIP Procedures Manual and any amendments thereto shall be subject to the prior approval of the AOCB.

28.05 Inspection Frequency

Motor vehicles required to be inspected pursuant to Section 28.03 shall be inspected at the following times:

1. For motor vehicles not covered by a fleet station permit, once every twelve (12) months on a staggered schedule determined by the Program Manager.

2. For used motor vehicles sold by a dealer located in Bernalillo County to a resident of Bernalillo County, prior to the transfer of title that used motor vehicle.

3. For governmental vehicles at least every twelve (12) months following the date of acquisition by the operating entity in Bernalillo County.

4. For vehicles owed or leased by a person having a valid fleet emission inspection station permit, once every twelve (12) months following the date of acquisition.

Table 1

DYNAMOMETER LOADING SPECIFICATIONS

Speed (MPH)	Load (Road HP)
16-22	1.2 - 2.8
22-25	2.8 - 4.1
25-29	4.1 - 6.4
29-32	6.4 - 8.4
32-35	8.4 - 10.8
35-38	11.8 - 13.6
44-46	20.8 - 23.7
48-50	26.8 - 30.0

28.06 The mandatory vehicular emissions inspections

A. The exhaust emissions inspection for motor vehicles shall consist of sampling the exhaust emissions from the vehicle's engine and measuring the concentrations of CO and HC in accordance with the requirements specified in Section 28.06-E.

1. All motor vehicles of model year 1980 or earlier shall be tested utilizing the idle mode test as described in the MVIP Procedures Manual. A loaded mode test as described in the MIVP Procedures Manual and utilizing the dynamometer loadings specified in Table 1, shall be conducted for diagnostic purposes only and shall be at the option of the motor vehicle driver. 1981 Model year and subsequent model year motor vehicles shall be tested using only the loaded mode test as described in the MVIP Procedures Manual and utilizing the dynamometer loadings specified in Table 1 unless tested only in the idle mode and fast idle mode as described in Section 28.06-B and D.

For reasons of safety, the driver of the motor vehicle shall yield the driver's seat to the vehicular emissions inspector when a loaded-mode test is conducted.

B. The idle mode test and/or fast idle mode test only shall be performed in lieu of the loaded mode test on any vehicle by an official emissions inspection station if:

1. The vehicle has any condition that in the opinion of the vehicular emissions inspector precludes loaded testing for reason of safety to personnel, equipment, or vehicle.

2. A vehicle driven by a person who, because of physical incapacity is unable to yield the driver's seat to the emissions inspector.

3. The driver requests only the idle mode test when a loaded mode test is for diagnostic purposes only.

4. The vehicle is unable to be tested according to the dynamometer loading table because of the vehicle's inability to attain the speeds specified.

5. The vehicle is equipped with constant four wheel drive.

Table 2

MAXIMUM ALLOWABLE EXHAUST EMISSIONS

Model Year	HC(ppm)	CO(%)
Cars:		
1968-1971	950	9.5
1972-1974	850	8.5
1975-1979	700	7.0
1980	450	4.5
1981 and newer	220	1.2
Trucks Up to 6000 GVW:		
1968-1971	950	9.5
1972-1974	850	8.5
1975-1983	700	7.0
1984 and newer	220	1.2
Trucks 6001 to 8500 GVW:		
1968-1972	950	9.5
1973-1978	850	8.5
1979-1983	700	7.0
1984 and newer	220	1.2

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[1] All rotary piston engines shall be treated in the same manner as engines with four cylinders or less.

[2] All turbine engines shall be treated as engines having more than four cylinders.

C. No mandatory vehicular emissions inspection shall be performed on vehicles with exhaust system leaks as evidenced by visual, audible, or exhaust dilution detection. Any vehicle which has been refused inspection on these grounds shall be entitled to an inspection and possible reinspection within 30 days at no additional charge.

D. At the option of the fleet emission inspection station, vehicles that qualify as part of a fleet inventory may be tested in the idle mode and/or fast idle mode.

E. All vehicles shall not exceed the maximum allowable exhaust emissions as prescribed in Table 2 when the exhaust emissions are sampled under the conditions prescribed in Section 28.06-A. Any vehicle that exceeds the maximum allowable exhaust emissions shall fail the emissions inspection.

F. Vehicles that are designed to operate with gasoline and another fuel shall be tested on gasoline at time of inspection. The corresponding maximum allowable exhaust emissions for gasoline shall apply.

G. All reconstructed vehicles that are subject to this program shall be inspected for emissions compliance using the maximum allowable exhaust emissions applicable to vehicles of 1968 model year.

28.07 Evidence of meeting the inspection requirements.

Any of the following documents, when complete, unaltered and properly dated, shall be accepted as evidence that a vehicle is in compliance with the requirements of these Regulations unless there is reason to believe it is a false document.

1. Certificate of compliance
2. Certificate of waiver
3. Certificate of exemption

28.08 Procedure for issuing certificates of waiver

A. A certificate of waiver may be issued if low emission related repairs specified in the MVIP Procedures Manual have been accomplished and the maximum repair cost, as specified in Section 28.08-D., has been reached.

B. Application for a certificate of waiver shall be made at the Referee facility within 30 calendar days of the initial inspection.

1. Accompanying each application shall be a report completed by the repairing facility utilizing an approved emissions analyzer. In completing the report, information as specified in the MVIP Procedures Manual shall be included.

2. The completed report shall be submitted to the Referee Facility with a fee of two dollars ($2), payable in cash.

C. Only the MVIP shall evaluate applications for certificate of waiver and issue a certificate of waiver when provisions of these regulations have been met.

D. The maximum required low emission related repair cost for vehicles to qualify for a certificate of waiver is seventy-five dollars ($75) providing that costs of replacing any exhaust emission control device which has been removed or rendered inoperable by any person shall not be included in calculating the cost of repairs. This does not prevent the vehicle owner from authorizing or performing more than the required repairs. Vehicle operators shall have repair receipts available when requesting a certificate of waiver.

28.09 Inspection report

A. Each vehicle inspected at an official emission inspection station or Referee Facility shall be provided an inspection report. The inspection report shall provide the information specified in the MVIP Procedures Manual.

B. The inspection report will provide a tear-out section to be used as a certificate of compliance or as a certificate of waiver when applicable. Certificates of compliance and certificates of waiver will not be replaced if lost.

C. An inspection report of a design approved by the Program Manager shall be provided to each vehicle inspected at an official emissions inspection station or referee facility. The inspection report shall indicate "pass," "fail," "waiver" or "exempt." Inspection reports will not be replaced if destroyed, altered, or lost.

D. Inspection reports shall expire 1 year from the date of issue except for inspection reports indicating "exempt," which shall conform to the exemption period provisions of Section 28.15-B.

28.10 Inspection fee

A. Each vehicle that is inspected by an official emission inspection station must be accompanied by a document such as registration, or Certificate of Title, which identifies the vehicle by make, model year, VIN and license plate if applicable.

B. The fee for an emissions inspection at an official emissions inspection station shall be $ (reserved — to be adopted at a later date) and is payable in cash at the time of inspection to the independent contractor unless the vehicle qualifies for an inspection without charge as specified in Section 28.11.

28.11 Reinspections

Each vehicle which fails its initial inspection is entitled to the first reinspection at no additional charge within thirty (30) consecutive calendar days of the initial inspection but not thereafter; and the vehicle is accompanied by the completed inspection report.

28.12 Fleet inspection stickers

A. Fleet inspection stickers shall be used by a fleet emission inspection station as evidence that its vehicles have met requirements of these Regulations.

B. A fleet inspection sticker shall be completed with the following information specified in the MVIP Procedures Manual.

C. Fleet inspection stickers, either complete or incomplete, are not transferable.

D. An inspection sticker shall be applied to each vehicle inspected at a fleet emission inspection station.

E. Inspection stickers will not be replaced if destroyed, altered, or lost. Voided or unusable stickers shall be presented to the MVIP for replacement without charge.

F. Fleet inspection stickers shall be obtained only from the MVIP.

G. The charge for stickers is two dollars ($2) each. The payment for the stickers shall be included with the application for stickers. Checks are to be made payable to the City of Albuquerque.

H. The fleet emission inspection station operator shall be held responsible for the security and accountability of all his stickers.

I. In the event that any stickers are lost or stolen, the fleet emission inspection station operator shall notify the MVIP in writing within twenty-four (24) hours and indicate the number of stickers lost or stolen and their serial numbers.

28.13 Fleet emission inspection station permits and procedures

A. All fleet vehicles for which a fleet emission inspection station permit has been issued shall be inspected as specified in Section 28.05 while the vehicles are part of the fleet.

1. All motor vehicles of model years 1968 through 1980 shall be tested utilizing

the idle mode test as specified in the MVIP Procedures Manual. 1981 and subsequent model year motor vehicles shall be tested utilizing the idle and fast idle mode tests as described in the MVIP Procedures Manual.

B. The following apply to permits for fleet emission inspection stations:

1. Any registered owner or lessee of a fleet of twenty-five (25) or more motor vehicles whose place of business is located in Bernalillo County may apply to the MVIP for a permit to establish a fleet emission inspection station. The MVIP will not issue any fleet emission inspection station. The MVIP will not issue any fleet emission inspection station permit until it has found that the applicant:

a. Maintains an established facility for the repair and maintenance of the applicant's fleet of vehicles which meets the following requirements:

i. The repair facility must be exclusively rented, leased, or owned by the fleet operator, or the person(s) or firm which holds a valid contract to maintain the vehicle fleet for which the application is being submitted.

ii. Provides a suitable space devoted principally to maintaining or repairing the fleet's motor vehicles. Such space shall be of sufficient area to conduct maintenance or repair of a least one fleet motor vehicle.

b. Employs at least one vehicular emissions mechanic to perform low emission tune-ups of engine and replacement or repair of carburetion and ignition components, and fuel systems of engines in the vehicle fleet.

c. Has obtained an approved CO/HC emission analyzer to conduct the required inspections and the tools and other equipment necessary to perform low emission tune-ups as specified in the MVIP Procedures Manual.

d. Agrees to provide information to the MVIP as prescribed in this Section.

2. Application forms may be obtained from the MVIP.

3. All completed applications shall be submitted to the MVIP.

4. Before an original application for a fleet emission inspection station permit is approved, an inspection of the premises will be made by an MVIP inspector to determine compliance with this section.

5. A fleet emission inspection station permit shall expire one (1) year from date of issuance.

6. The fleet emission inspection station permit may be renewed upon submittal of a renewal application to the MVIP thirty (30) days prior to expiration.

7. A fleet emission inspection station permit shall only be applicable to the fleet's inspection facility located at the address shown on the fleet emission inspection station permit. If a fleet owner wishes to have a permit for inspection facilities at more than one address, then separate permit applications must be submitted for each address.

8. Fleet emission inspection station permits issued by the MVIP are not transferable.

9. When permit name or address changes do not involve a change of ownership, the permit shall be returned to the MVIP for cancellation and a new permit application shall be submitted. The MVIP will cancel the returned permit and issue a new permit for the unexpired term.

10. In the event of loss, destruction, or mutilation of the permit, the person to whom it was issued may obtain a duplicate upon furnishing satisfactory proof of the fact. Any fleet that loses a fleet emission inspection station permit issued by the MVIP, and after obtaining a duplicate finds the original, shall immediately surrender the original permit to the MVIP.

11. Persons whose permits have expired shall immediately cease the activity requiring a permit, but the MVIP shall accept applications for renewal during the thirty--day (30) period following the date of expiration. In no case may a permit be renewed where application is received more than thirty (30) days after the date of expiration; in such cases, an application for a new permit will be required.

12. A fleet emission inspection station which does not have at least one vehicular emissions mechanic in its employ shall immediately cease to operate as a fleet emission inspection station.

13. When a fleet emission inspection station permit is surrendered, suspended, or revoked, all unused vehicle certificates of inspection shall be returned to the MVIP for a refund.

C. The MVIP may suspend or revoke a fleet emission inspection station permit if the permittee or officer, employee or any partner thereof:

1. Violates any provision of these regulations.

2. Has misrepresented a material fact in obtaining a permit.

3. Fails to make and keep records showing vehicles tested as a permittee, or fails to submit information to the MVIP.

4. Fails to maintain conformance with all qualifying requirements of Section 28.13-B.

5. Does not provide an MVIP inspector access to the information required by these Regulations.

D. The fleet emission inspection station permit shall be prominently displayed within the station.

E. A written notification must be submitted to the MVIP by the fleet emission inspection station operator within seven (7) days of any change of the employment status of the fleet emission inspection station's vehicular emissions mechanic(s).

F. The inspection equipment shall be as follows:

1. Each fleet emission inspection station shall be equipped with approved CO/HC emission analyzers.

2. All test equipment and instrumentation shall be maintained in good working condition. Instruments requiring periodic calibration shall be calibrated in accordance with instructions and recommendations of the instrument or equipment manufacturer except that recommendations by the MVIP for calibration or intervals between calibration may be a condition of the fleet emission inspection station permit and shall supersede any and all other conflicting recommendations. A record of calibrations performed on each instrument shall be maintained by the fleet emission inspection station indicating the date and authentication of the technician performing the previous calibration.

3. The instrument calibration records will be subject to review by the MVIP.

4. Working gases used by the fleet emission inspection station shall be subject to evaluation and approval by the MVIP at any time.

5. Fleet emission inspection station equipment shall be subject to both scheduled and unscheduled checks for accuracy and condition by the MVIP in accordance with this section.

G. Fleet inspection stickers shall be processed as follows:

1. A fleet inspection sticker shall be completed and issued to a vehicle immediately after the vehicle has passed the mandatory vehicular emissions inspection.

2. The expiration date shall be one (1) year from the date that the vehicle has passed the mandatory vehicular emissions inspection.

3. All information required on the fleet inspection sticker shall be entered with sufficient pressure to ensure that all copies of the sticker are legible.

4. Any entries on fleet inspection stickers that are incorrect shall be corrected and authenticated by the initials of the vehicular emissions mechanic.

5. Only the vehicular emissions mechanic may sign a fleet inspection sticker.

6. The original completed fleet inspection sticker shall be applied to the vehicle at a location specified by the Program Manager.

7. The second copy of each completed fleet inspection sticker shall be forwarded to the MVIP within seven (7) days after completion of sticker.

I. Data as specified in the MVIP Procedures Manual shall be compiled by the fleet emission inspection station for each vehicle inspected and a record retained for one (1) year from the date of inspection.

J. Upon his request an MVIP inspector

shall be allowed access to any or all of the inspection data.

K. Fleet vehicles are subject to reinspection at any time by MVIP inspector for the purpose of validating the fleet operator's inspection procedures.

28.14 Procedure for waiving inspections due to technical difficulties

The Program Manager may issue a certificate of exemption for any vehicle that cannot be subjected to the inspection required by these Regulations because of technical difficulties inherent in the manufacturer's design or construction of the vehicle.

28.15 Certificate of exemption

A. When a vehicle will not be available for inspection within Bernalillo County during the thirty-day (30) period prior to that vehicle's annual mandatory vehicular emissions inspection, the owner or his agent may apply in writing to the MVIP for a certificate of exemption.

B. The owner or his agent shall complete the affidavit portion of the certificate of exemption form and submit it to the MVIP. The MVIP will evaluate the application and designate an appropriate exemption period based on information in the application.

C. Certificates of exemption will be issued to all new motor vehicles registered for the first time from a manufacturer's statement of origin (MSO)

1. New car dealers who hold a fleet emissions inspection station permit may issue certificates to new motor vehicles.

2. New car dealers who do not hold a fleet emissions inspection station permit shall obtain certificates at the Referee Facility.

3. The charge for certificates of exemption Two Dollars ($2) each. Checks are to be made payable to the City of Albuquerque.

28.16 Inspection of official emissions inspection stations

A. Official emission inspection station inspectors shall not recommend repairs or repair facilities.

B. The MVIP shall verify by inspection that the official emissions inspection station's equipment and facilities meet the specifications and tolerances as prescribed in these regulations and in the contract between the City of Albuquerque and the independent contractor.

28.17 Inspection of fleet emission inspection station analyzers

A. MVIP inspectors will check the calibration of emission analyzers used by the fleet emission inspection stations with the field calibration gases.

B. A fleet emission inspection station emissions analyzer shall not be used if it does not read the MVIP's field calibration gases within the tolerances prescribed by the MVIP procedures manual, or if there is a leak in the sampling systems or the calibration port, or if the sample handling system is restricted.

F. A MVIP inspector shall retire and tag a fleet emission inspection station emission analyzer upon his determining that the analyzer does not meet the requirements of these regulations. Such analyzer shall not be used for inspection until the tag is removed by an MVIP inspector.

G. An analyzer tagged in accordance with Section 28.17-F shall not be returned to service until its accuracy is verified by an MVIP inspector.

H. All fleet emission inspection stations are responsible for periodic maintenance and calibrations of their emissions analyzers.

I. A fleet emission inspection station may lease or borrow an emission analyzer for temporary use while the station's approved analyzer is being repaired provided that an MVIP inspector has approved its use.

28.18 Registration of repair industry analyzers

A. Any equipment repair facility or individual who calibrates NDIR CO/HC exhaust emission analyzers may purchase calibration gases from a supplier of his choice.

B. An automotive repair facility shall apply to the MVIP at no charge for registration of NDIR CO/HC emission analyzers that are used in the repair or adjustment of vehicles.

C. Calibration shall be verified by an MVIP inspector before an analyzer may be registered. To qualify for registration the analyzer shall be an approved CO/HC emission analyzer, which meets the specifications indicated in the MVIP procedures manual.

D. Each registered analyzer used by a repair facility shall have a unique registration number assigned by the MVIP. A file will be kept by the MVIP on each analyzer which contains the following information:

1. The manufacturer's serial number
2. The manufacturer's make and model
3. The name and address of the repair facility using the analyzer
4. The date and results of the inspection of the analyzer by the MVIP.

E. An MVIP inspector shall tag a registered analyzer upon determining that the analyzer does not meet the requirements of this Section.

F. The tag shall be removed by an MVIP inspector after the analyzer accuracy is verified.

NEW YORK

TABLE 2

MAXIMUM ALLOWABLE VISIBLE EMISSION OPACITY LIMITS

Source category	*Date application for permit to construct received*	*Emission point*	*Six minute average opacity shall not exceed*
Basic oxygen furnace	On or before 6/11/73	Stack	20%
	After 6/11/73	Stack	*10%
	All	Fugitive	20%
Electric arc furnace	On or before 10/21/74	Stack	10%
		Fugitive	20%
	After 10/21/74	Stack	3%
		Fugitives during tapping	40%
		Fugitives during charging	20%
		Fugitives at other times	** 0%
Blast furnaces	All	Stack	20%
If equipped with exhaust hoods (216.8(a)(1) and (b))	All	Fugitives	20%
If equipped with an emission shrouding and suppression system (216.8(a)(2))	All	Fugitives during drilling & plugging of tap hole	40%
		Fugitives all other times	15%
All other iron and/or steel industry sources	All	Stack and Fugitives	20%

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* Except that an average of opacity exceeding 10% but less than 20% may occur once during the steel production cycle.

** Except 10% for emissions associated with particulate storage and transfer equipment collected by an air cleaning device.

PART 217

EMISSIONS FROM MOTOR VEHICLES PROPELLED BY GASOLINE ENGINES

(Effective February 5, 1982; Jan. 1, 1984; January 29, 1986)

Section 217.1 Definitions.

(a) "Motor Vehicle" means every vehicle included in the definition of the term "motor vehicle" in section 125 of the Vehicle and Traffic Law; every vehicle included in the definition of the term "limited use automobile" in section 121-a of the Vehicle and Traffic Law; except those vehicles specifically set forth in subdivisions 15 NYCRR 79.2(d) and (e).

(b) "New York Metropolitan Air Quality Control Region" means the region comprising the counties of Suffolk (except Fisher's Island), Nassau, Kings, Queens, Richmond, New York, Bronx, Westchester and Rockland.

(c) "Emissions Inspection Procedure (VS-28)" means a document issued by the Commissioner of Motor Vehicles which establishes the procedure for conducting periodic motor vehicle inspections.

Section 217.2 Motor vehicles subject to exhaust emissions inspection and procedure.

(a) Applicability. This Part applies to all gasoline powered motor vehicles which are registered in the New York Metropolitan Air Quality Control Region and are subject to the vehicle exhaust emissions test as part of the annual vehicle inspection except those motor vehicles expressly excluded by subdivision 15 NYCRR 79.2(f).

(b) No person who owns, operates, or leases a gasoline powered motor vehicle subject to an exhaust emission test shall operate said vehicle, or allow or permit it to be operated, in such a manner that it emits carbon monoxide (CO) or hydrocarbons (HC) in the exhaust in excess of the standards set forth in Table 1 or that has a combined carbon monoxide (CO) and carbon dioxide (CO_2) emission less than 6.0 percent when measured using the test procedure specified in the Department of Motor Vehicles "Emissions Inspection Procedure" document (VS-28).

Table 1

Vehicle Model Year		Carbon Monoxide Limit (CO, %)	Hydrocarbon Limit (HC, ppm)
Light Duty (8500 pounds and under)	Heavy Duty (over 8500 pounds)		
	1569 and older	7.0	800
1974 and older	1970 to 1973	6.0	700
	1974 to 1978	4.5	600
1975 to 1978	1979 and newer	3.5	400
1979 and 1980		2.5	300
1981 and newer		1.2	220

PART 218
VEHICLES PROPELLED BY DIESEL ENGINES

(Effective May 1, 1972; May 10, 1981)

Section 218.1 Applicability. This Part shall apply to all vehicles propelled by a diesel engine, excluding marine vessels.

218.2 Prohibitions. (a) No person who owns, operates or leases a vehicle propelled by a diesel engine or who owns, leases or occupies land and has actual or apparent dominion or control over the operation of a vehicle propelled by a diesel engine which is present on said land, shall operate said vehicle or allow or permit it to be operated, in such a manner that exhaust emissions of a shade of blue, black or grey equal to or greater than Number 1 on the Ringelmann chart or equivalent standard acceptable to the Commissioner are produced for a continuous period of more than five seconds when the vehicle is in motion.

(b) No person who owns, operates or leases a bus or truck, the motive power for which is provided by a diesel engine or who owns, leases or occupies land and has the actual or apparent dominion or control over the operation of a bus or truck present on such land, the motive power for which said bus or truck is provided by a diesel engine, shall allow or permit the diesel engine of such bus or truck to idle for more than five consecutive minutes when the bus or truck is not in motion, except as otherwise permitted by section 218.3.

218.3 Exceptions. The prohibitions of subdivision (b) of Section 218.2 shall not apply when:

(a) A bus or truck is forced to remain motionless because of traffic conditions over which the operator thereof has no control.

(b) Regulations adopted by federal, state or local agencies having jurisdiction require the maintenance of a specific temperature for passenger comfort. The idling time specified in subdivision (b) of section 218.2 may be increased but only to the extent necessary to comply with such regulations.

(c) A diesel engine is being used to provide power for an auxiliary purpose, such as loading, discharging, mixing or processing cargo; controlling cargo temperature; construction; lumbering; oil or gas well servicing; farming; or when operation of the engine is required for the purpose of maintenance.

(d) Fire, police and public utility trucks or other vehicles are performing emergency services.

(e) Trucks owned or operated by persons engaged in mining and quarrying are used within the confines of such persons' property.

(f) A truck is to remain motionless for a period exceeding two hours, and during which period the ambient temperature is continuously below twenty-five degrees Fahrenheit.

PART 219

INCINERATION

(Effective May 1, 1972; Revised effective February 3, 1989)

SUBPART 219-1

INCINERATION — GENERAL PROVISIONS

219-1.1 Definitions. (a) For the purpose of this Part and each of the Subparts of this Part, the general definitions of Part 200 of this Title apply.

(b) For the purpose of this Part, the following definitions also apply:

(1) Commercial waste. Solid waste generated by stores, offices, institutions, restaurants, warehouses, and non-manufacturing activities at industrial facilities.

(2) Dioxin equivalent. Any combination or mix of polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans containing from four to eight chlorine atoms which are expressed as 2,3,7,8 tetrachlorinated dibenzo-para-dioxin equivalents using the toxic equivalency factors listed below. Standard conditions upon which these data are referenced are an absolute pressure of 760 mm mercury and 20° C at 7% oxygen.

	Compound	Factor
	monochlorinated dibenzo-para-dioxins (all)	0
	trichlorinated dibenzo-para-dioxins (all)	0
	dichlorinated dibenzo-para-dioxins (all)	0
2,3,7,8	tetrachlorinated dibenzo-para-dioxin	1
other	tetrachlorinated dibenzo-para-dioxins	0.01
2,3,7,8	pentachlorinated dibenzo-para-dioxin	1
other	pentachlorinated dibenzo-para-dioxins	0.01
2,3,7,8	hexachlorinated dibenzo-para-dioxin	0.03
other	hexachlorinated dibenzo-para-dioxins	0.0003
2,3,7,8	heptachlorinated dibenzo-para-dioxin	0.001
other	heptachlorinated dibenzo-para-dioxins	0.00001
	octachlorinated dibenzo-para-dioxins	0
2,3,7,8	tetrachlorinated dibenzo furan	0.33
other	tetrachlorinated dibenzo furans	0.003
2,3,7,8	pentachlorinated dibenzo furan	0.33
other	pentachlorinated dibenzo furans	0.003
2,3,7,8	hexachlorinated dibenzo furan	0.01
other	hexachlorinated dibenzo furans	0.0001
2,3,7,8	heptachlorinated dibenzo furan	0.001
other	heptachlorinated dibenzo furans	0.00001
	octachlorinated dibenzo furans	0

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court of the county in which the violation occurred or may occur. Upon a determination by the court that the alleged violation of the provisions of this Article and Article 21 or the regulation of the Commission has occurred or is threatened, the court shall grant the relief necessary to prevent or abate the violation or threatened violation. Neither the institution of the action nor any of the proceedings thereon shall relieve any party to such proceedings from any penalty prescribed for violation of this Article.

Sec. 20-128.1 Control of visible emissions — (a) It shall be a violation of this Article:

(1) For any gasoline powered motor vehicle registered and operated in this State to emit visible air contaminants under any mode of operation for longer than five consecutive seconds.

(2) For any diesel powered motor vehicle registered and operated in this State to emit for longer than five consecutive seconds under any mode of operation visible air contaminants which are equal to or darker than the shade or density designated as No. 1 on the Ringelmann Chart or are equal to or darker than a shade or density of twenty percent (20%) opacity.

(b) Any person charged with a violation of this section shall be allowed 30 days within which to make the necessary repairs or modification to bring the motor vehicle into conformity with the standards of this section and to have the motor vehicle inspected and approved by the agency issuing the notice of violation. Any person who, within 30 days of receipt of a notice of violation, and prior to inspection and approval by the agency issuing the notice, receives additional notice or notices of violation, may exhibit a certificate of inspection and approval from the agency issuing the first notice in lieu of inspection and approval by the agencies issuing the subsequent notices.

(c) The provisions of this section shall be enforceable by all persons designated in G.S. 20-49; by all law-enforcement officers of this State within their respective jurisdictions; by the personnel of local air pollution control agencies within their respective jurisdictions; and by personnel of State air pollution control agencies throughout the State.

(d) Any person who fails to comply with the provisions of this section shall be subject to the penalties provided in G.S. 20-176.

Sec. 20-128.2. Motor vehicle emission standards. — (a) The rules and regulations promulgated pursuant to G.S. 143-215.107(a)(6) for the purposes of this section shall be limited to carbon monoxide, shall be statewide in scope but enforced on a county unit basis when ambient air pollutant concentrations exceed the National Ambient Air Quality Standards established pursuant to the Clean Air Act of 1970 as amended by the Clean Air Act amendments of 1977 and when the Environmental Management Commission certifies to the Commissioner of Motor Vehicles that the ambient air quality within a specified county requires a motor vehicle inspection/maintenance program; provided the Environmental Management Commission may prescribe different standards for different areas as may be necessary and appropriate to facilitate accomplishment of the stated purposes of this section. Such standards shall be no more restrictive or stringent than federal standards, as required by G.S. 143-215.107(f).

(b) Rules and regulations promulgated pursuant to this section shall be implemented through the use of the safety inspection stations licensed pursuant to Article 3A of Chapter 20 of the General Statutes.

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treated in an equally effective manner before being released to the ambient air. The emissions from all devices designed for incinerating, flaring, or treating waste organic compounds gases and vapors shall result in compliance with the ambient air quality standards

3. Each flare must be equipped and operated with an automatic ignitor or a continuous burning pilot.

Chapter 33-15-08
Control of Air Pollution from Vehicles and Other Internal Combustion Engines

33-15-08-01. Internal Combustion Engine Emissions Restricted. No person shall operate, or cause to be operated, any internal combustion engine which emits from any source any unreasonable and excessive smoke, obnoxious or noxious gases, fumes or vapor.

33-15-08-02. Removal or Disabling of Motor Vehicle Pollution Control Devices Prohibited.

1. No person shall intentionally remove, alter, or otherwise render inoperative, exhaust emission control, crankcase ventilation, or any other air pollution control device which has been installed as a requirement of federal law or regulation.

2. No person shall operate a motor vehicle originally equipped with air pollution control devices as required by federal law or regulation unless such devices are in place and in operating condition.

Chapter 33-15-09
Emission of Certain Settleable Acids and Alkaline Substances Restricted

33-15-09-01. General Provisions. This chapter applies to all emissions from any source or any premises.

33-15-09-02. Emissions Restricted. No person shall cause or permit the emission from any source or premises of substances having acidic or alkaline properties in such manner and amounts that the downwind fallout rate of acidic or alkaline substances, at any place where an adverse effect could occur, exceeds the upwind fallout rate by five or more spots per hour, as measured in the manner prescribed in section 33-15-09-03.

33-15-09-03. Method of Measurement.

1. The fallout sampling devices used in determining compliance with this chapter shall consist of circular glass dishes fifteen centimeters in diameter. The dishes shall be supported on a nearly horizontal surface not larger than the dish. The dish bottom shall be at least three feet [91.44 centimeters] above the earth or other surface on which its support is resting. The dish shall be coated with a solution of thymol blue, ammonia water solution and gelatin dried to a yellow color in a vacuum oven at room temperature. Prepared dishes shall be stored in a desiccator at forty percent relative humidity, or in plastic bags.

2. Fallout sampling devices shall be put in place at one or more locations upwind and downwind of a premises at locations beyond the premises on which a source or sources are located. The devices shall be left exposed to substances settling out of the ambient air for a period of one hour. The presence of red-colored spots visible to the naked eye on the samplers used to measure fallout of acidic substances shall be construed to mean that acidic substances have settled out of the air. The presence of blue-colored spots visible to the naked eye on the samplers used to measure fallout of alkaline substances shall be construed to mean that alkaline substances have settled out of the air. The number of spots visible on samplers exposed upwind of a premises is to be subtracted from the number of spots visible on samplers exposed downwind of the same premises. The difference in the number of spots, if any, shall be construed to be attributable to emissions occurring on the premises under investigation.

3. In lieu of the test methods specified in subsections 1 and 2, any other method approved by the department may be used.

Chapter 33-15-10
Control of Pesticides
[Omitted]

Chapter 33-15-11
Prevention of Air Pollution Emergency Episodes

33-15-11-01. Air pollution emergency. This chapter is designed to prevent the excessive buildup of air contaminants during air pollution episodes, thereby preventing the occurrence of an emergency due to the effects of these air contaminants on human health.

33-15-11-02. Air pollution episode criteria. Conditions justifying the proclamation of an air pollution alert, air pollution warning, or air pollution emergency shall be deemed to exist whenever the department determines that the accumulation of air contaminants in any place within North Dakota is attaining or has attained levels which could, if such levels are sustained or exceeded, lead to a substantial threat to human health. In making this determination, the department will be guided by the criteria listed in table 6.

33-15-11-03. Abatement strategies emission reduction plans.

1. When the department declares an air pollution alert, air pollution warning, or air pollution emergency, any person responsible for the operation of a source of air contaminants as set forth in table 7 shall take all actions as required by table 7 for such source of air contaminants for the level declared and shall put into effect the preplanned abatement strategies plan for the level declared. The department shall notify the public by means of a public announcement whenever an air pollution alert, air pollution warning, or air pollution emergency has been determined to exist.

2. When the department determines that a specified criteria level has been reached at one or more monitoring sites solely because of emissions from a limited number of sources, the department shall notify such source or sources that the actions set forth in table 7 or the preplanned abatement strategies plans are required, insofar as it applies to such source or sources and shall be put into effect until the criteria of the specified level are no longer met.

33-15-11-04. Preplanned abatement strategies plans.

1. Any person responsible for the operation of a source of air contaminants as set forth in table 7 shall prepare abatement strategies plans for reducing the emission of air contaminants during periods of an air pollution alert, air pollution warning, and air pollution emergency. Abatement strategies plans shall be designed to reduce or eliminate emissions of air contaminants in accordance with the objectives set forth in table 7.

2. Any person responsible for the operation of a source of air contaminants not set forth under subsection 1 shall, when requested by the department, in writing, prepare abatement strategies plans for re-

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TABLE 5 EMISSION REDUCTION OBJECTIVES FOR CARBON MONOXIDE

	SOURCE OF AIR CONTAMINATION	AIR POLLUTION ALERT	AIR POLLUTION WARNING	AIR POLLUTION EMERGENCY
1	A—Manufacturing industries	a. Substantial reduction of air contaminants from manufacturing operations by curtailing, postponing, or deferring production and allied operations	a. Maximum reduction of air contaminants from manufacturing operations by, if necessary, assuming reasonable economic hardship by postponing production and allied operations	a. Elimination of air contaminants from manufacturing operations by ceasing, curtailing, postponing or deferring production and allied operations to the extent possible without causing injury to persons or damage to equipment
	AND			
	B—Other persons required by the Board to prepare standby plans			
2	Refuse disposal operations	a. Maximum reduction by prevention of open burning	a. Maximum reduction by prevention of open burning	a. Maximum reduction by prevention of open burning

3745-25-04 Emergency orders

(A) The following orders may be issued by the director upon his declaration that an air pollution episode exists for any air contaminants for which air quality standards have been adopted.

(1) Air "Alert"

(a) Any one or combination of air contaminants. Any person responsible for the operation of a source of air contamination as set forth in paragraph (A) of rule 3745-25-03 of the Administrative Code shall take all air pollution "Alert" actions as required for such source of air contamination; and shall particularly put into effect, the emission control action programs for an air pollution "Alert".

(b) Suspended particulate matter.

(i) There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.

(ii) The use of incinerators for the disposal of any form of solid waste will be limited to the hours between twelve noon and four p.m.

(iii) Persons operating fuel-burning equipment which requires boiler lancing or soot blowing shall perform such operations only between the hours of twelve noon and four p.m.

(c) Nitrogen oxides, carbon monoxide, hydrocarbons and photochemical oxidants (measured as ozone).

(i) There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.

(ii) The use of incinerators for the disposal of any form of solid waste shall be limited to the hours between twelve noon and four p.m.

(iii) Persons operating motor vehicles shall be strongly encouraged to eliminate the unnecessary use of automobiles, motorcycles, light-duty trucks and vans, and recreational vehicles.

(2) Air pollution "Warning"

(a) Any one or combination of air contaminants. Any person responsible for the operation of a source of air contamination as set forth in paragraph (A) of rule 3745-25-03 of the Administrative Code shall take all air pollution "Warning" actions as required for such source of air contamination and shall particularly put into effect the emission control action programs for an air pollution "Warning".

(b) Suspended particulate matter.

(i) There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.

(ii) The use of incinerators for the disposal of any form of solid waste or liquid waste shall be prohibited.

(iii) Persons operating fuel-burning equipment which requires boiler lancing or soot blowing shall perform such operations only between the hours of twelve noon and four p.m.

(c) Nitrogen oxides, carbon monoxide, hydrocarbons and photochemical oxidants (measured as ozone).

(i) There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.

(ii) The use in incinerators for the disposal of any form of solid waste or liquid waste shall be prohibited.

(iii) Persons operating motor vehicles shall be strongly encouraged to eliminate the unnecessary use of automobiles, motorcycles, light-duty trucks and vans and recreational vehicles. Citizens who travel to and from work between the hours of six a.m. and six p.m. are urged to car-pool or utilize public transportation.

(iv) For carbon monoxide "Warnings", persons operating motor vehicles shall be encouraged to avoid the air pollution "Warning" area.

(3) Air pollution "Emergency"

(a) Any one or combination of contaminants:

(i) Any person responsible for the operation of a source of air contamination as described in paragraph (A) of rule 3745-25-03 of the Administrative Code shall take all air pollution "Emergency" actions as listed as required for such source of air contamination and shall particularly put into effect the emission control action programs for an air pollution "Emergency".

(ii) All manufacturing establishments except those included in paragraph (A)(3)(a)(i) of this rule will institute such action as will result in maximum reduction of air contaminants from their operations by ceasing, curtailing, or postponing operations which emit air contaminants to the extent possible without causing injury to persons or damage to equipment.

(iii) All places of employment described below shall immediately cease operations:

(a) Mining and quarrying of non-metallic minerals.

(b) All contract construction work except that which must proceed to avoid physical harm.

(c) Wholesale trade establishments, including places of business primarily engaged in selling merchandise to retailers, to industrial, commercial, institutional or professional users, or to other wholesalers, or acting as agents in buying merchandise for or selling merchandise to such persons or companies.

(d) All offices of local, county, and state government including authorities, joint meetings, and any other public body, except to the extent that such offices must continue to operate in order to enforce the requirements of this order pursuant to statute.

(e) All retail trade establishments except pharmacies and stores primarily engaged in the sale of food.

(f) Banks, credit agencies other than banks, securities and commodities brokers, dealers, exchanges and services, offices of insurance carriers, agents and brokers, real estate offices.

(g) Wholesale and retail laundries, laundry services and cleaning and dyeing establishments, photographic studios, beauty shops, barber shops, shoe repair shops.

(h) Advertising offices, consumer credit reporting, adjustment and collection agencies, duplicating, addressing, blueprinting, photocopying, mailing, mailing list and stenographic services; equipment rental services, commercial testing laboratories.

(i) Automobile repair, automobile services, garages.

(j) Establishments rendering amusement and recreation services including motion picture theatres.

(k) Elementary and secondary schools, colleges, universities, professional schools, junior colleges, vocational schools, and public and private libraries.

(iv) There shall be no open burning by any persons of tree waste, vegetation, refuse, or debris in any form.

(v) The use of incinerators for the disposal of any form of solid or liquid waste shall be prohibited.

(vi) The use of motor vehicles including, but not limited to automobiles, motorcycles, light-duty trucks and vans, and recreational vehicles, shall be prohibited except in emergencies with the approval of local or state police.

(B) When the director of the Ohio environmental protection agency determines that an air pollution episode condition exists at one or more monitoring sites solely because of emissions from a limited number of sources, he may order such source or sources to put into effect the emission control action programs which are applicable for each episode stage.

Chapter 3745-26

Motor Vehicle Anti-Tampering Inspection Requirements

(Adopted effective July 29, 1976. Amended effective July 17, 1987; April 29, 1989)

3745-26-01 Definitions

(A) "Applicant" means any person who files for licensing as an official inspection station.

(B) "Anti-tampering inspection" or "inspection" means the procedures described in the "Inspections Procedures Manual" provided by the director.

(C) "Certified inspector" means an individual who has attended a required training course, successfully passed the examination and has been certified by the director to inspect motor vehicles subject to the requirements of this chapter.

(D) "Class A inspection station" means an official inspection station licensed by the director to inspect any and every motor vehicle presented to determine compliance with this chapter. Class A inspection stations shall include the following categories:

(1) Automobile repair or service facilities; and

(2) Automobile dealerships.

(E) "Class B inspection station" means an official inspection station licensed by the director to inspect only those vehicles which are owned by or under bona fide lease to the company in whose name the fleet inspection license is issued. Class B inspection stations shall include the following categories of establishments which possess twenty-five or more vehicles required to be inspected under this chapter

(1) Private business fleets, and

(2) Federal, state or political subdivisions of the state governmental fleets

(F) "Director" means the director of the Ohio environmental protection agency

(G) "Exemption certificate" means the official certificate, issued by the director, to a vehicle owner or lessee whose vehicle may not require inspection as prescribed in rule 3745-26-02 of the Administrative Code, but is not exempted by the bureau of motor vehicles without an inspection certificate. An exemption certificate shall serve the same purpose as the "inspection" or "leased" vehicle certificate to be presented to the registrar as required by section 4503 10 of the Revised Code

(H) "Foreign imported gray market vehicle" means any vehicle of a type required to be registered, brought into this state from another country, other than in the ordinary course of business by or through a manufacturer or dealer as defined in division (W) of section 4501 01 of the Revised Code.

(I) "Government vehicles" as defined and registered in section 4503 16 of the Revised Code

(J) "Gross vehicle weight" means weight of vehicle plus passengers as stated on the manufacturer's door plate

(K) "Inspection certificate" means the official inspection form presented to each vehicle owner or lessee at the time of an inspection which indicates the items inspected, their condition, and whether the vehicle is in compliance or is rejected for noncompliance of the anti-tampering inspection. An inspection certificate indicating compliance shall serve as the inspection certificate to be presented to the registrar as required by division (B) of section 4503.10 of the Revised Code

(L) "Inspection Procedures Manual" means the official document issued by the director to official inspection stations detailing the guidelines and repair requirements to be used in the anti-tampering inspection

(M) "Inspection station" means a person, firm, corporation, or governmental entity licensed by the director to conduct inspections in accordance with the station class A or class B designation

(N) "Lessee" means any person, firm, corporation or governmental entity not having title to a motor vehicle, but granted legal authority by the title holder to possess the vehicle. The lessee may have such vehicle inspected and obtain an inspection certificate on behalf of the owner

(O) "License" means the lawful authority granted by the director to operate an inspection station for the purpose of conducting inspections as required herein

(P) "Licensee" means the person, firm, corporation, partnership or governmental entity in whose name the director issues a license to conduct inspections

(Q) "Multi-fueled vehicle" means any vehicle originally manufactured, designed, or converted from its original manufacturer's specification to utilize more than one fuel type, one of which being gasoline

(R) "Owner" means any person, firm, corporation or governmental entity other than a manufacturer or dealer having title to a motor vehicle

(S) "Person" means the state, any political subdivision, public or private corporation, partnership, firm, association, individual or other entity

(T) "Compliance" means a vehicle has passed all aspects and parameters of the anti-tampering inspection

(U) "Official inspection station sign" means the official sign issued by the director designating an establishment as a licensed inspection station

(V) "Unladen weight" means weight of the vehicle without a load when it rolled off the assembly line at the factory and as stated on the bureau of motor vehicle registration weight classification

(W) "Vehicle" means a passenger car or light-duty truck having an unladen weight or gross vehicle weight of less than eighty-five hundred pounds

(X) "Vehicle identification number" means the manufacturer's original serial number affixed to or imprinted upon the chassis or other part of the motor vehicle

(Y) "VIN" means the same as vehicle identification number

(Z) "Engine conversion" means any motor vehicle having an engine block installed which differs from the original manufacturer's specification as certified as meeting United States environmental protection agency certification requirements.

3745-26-02 Obligations of motor vehicle owner

(A) Effective December 31, 1987, except as otherwise provided in paragraph (C) of this rule, the owner or lessee of a motor vehicle, the district of registration of which as determined under section 4503.10 of the Revised Code, is in Hamilton, Butler, Cuyahoga, Lake, or Lorain county, shall have an annual anti-tampering inspection of the motor vehicle performed at a licensed inspection station.

(1) Motor vehicles owned or leased, and operated by the state, federal, or any political subdivision of the state government which, according to the bureau of motor vehicles records, are located within Hamilton, Butler, Cuyahoga, Lake or Lorain county, are subject to the requirements of this chapter

(2) The director shall assign governmental entities a designated month to report annual motor vehicle inspection results

(B) The anti-tampering inspection required by paragraph (A) of this rule shall be performed during the twelve months before the registration deadline assigned under section 4503.101 of the Revised Code. An owner or lessee who registers a motor vehicle after the required registration period has ended may have the anti-tampering inspection performed at any time between the registration deadline and the actual registration date. This paragraph does not require the inspection of motor vehicles upon transfer of ownership or change of possession when the vehicle is to be registered for a period of less than twelve months

(C) The following motor vehicles are exempt from the requirements of this chapter

(1) Passenger and noncommercial vehicles, as defined in section 4501 01 of the Revised Code, that weigh over eight thousand five hundred pounds gross vehicle weight rating;

(2) Diesel-powered;

(3) Pre-1980 model year vehicles.

(4) Historical vehicles registered under section 4503 181 of the Revised Code

(5) Licensed collectors' vehicles as defined in section 4501 01 of the Revised Code

(6) Parade and exhibition vehicles registered under section 4503 18 of the Revised Code

(7) Motorcycles as defined in section 4511 01 of the Revised Code

(8) Commercial vehicles, as defined by section 4501 01 of the Revised Code, that weigh over six thousand five hundred pounds unladen weight as indicated on bureau of motor vehicles registration;

(9) Vehicles, the district of registration of which, as determined under section 4503 10 of the Revised Code is in Hamilton, Butler, Cuyahoga, Lake or Lorain county, that are leased for six months or more to a lessee whose county code, as designated on the motor vehicle registration, is outside Hamilton, Butler, Cuyahoga, Lake or Lorain

(10) Vehicles, the district of registration of which as determined under section 4503 10 of the Revised Code is in Hamilton, Butler, Cuyahoga, Lake or Lorain county, that are registered to full-time military personnel assigned to military reservations outside the state; and

(11) Vehicles for which salvage certificates of title have been issued under division (C) of section 4504 11 of the Revised Code

(12) Recreational vehicles and motor homes as defined in section 4501 01 of the Revised Code

(13) Electrically powered vehicles; and

(14) Alternative fueled vehicles using one hundred per cent propane, butane, alcohol, or natural gas

(D)(1) Vehicles exempt under paragraph (C)(1) of this rule shall have a one-time verification inspection conducted by the director or his authorized representative, upon verification of gross vehicle weight rating greater than eighty-five hundred pounds, the vehicle owner or lessee shall be given a permanent exemption certificate for annual registration renewal.

(2) Vehicles exempt under paragraph (C)(2) of this rule shall have a one-time only verification inspection conducted at any licensed inspection station. Upon diesel engine verification, a "pass" inspection certificate shall be issued by the inspection station to the vehicle owner or lessee for the owner's upcoming annual registration renewal

(a) Upon verification of the vehicle information thereon, the director shall issue a permanent exemption certificate to the owner or lessee which shall be valid so long as the vehicle remains registered in the name of the person to whom the exemption certificate is issued. Permanent exemptions are not transferable.

(b) The exemption certificate is considered void if the vehicle is modified in a manner to require it to be inspected.

(3) Vehicles exempt under paragraph (C)(3) to (C)(10) of the rule shall not be required to obtain exemption certificates. Verification that the above-referenced vehicles are exempt shall be made in accordance with registration requirements of Chapter 4501., 4503., 4504., 4505., and 4511. of the Revised Code by the bureau of motor vehicles.

(4) For vehicles exempt under paragraphs (C)(10), (C)(13) and (C)(14) of the rule, the owner or lessee shall obtain an exemption application from a licensed inspection station or the director or his authorized representative. The vehicle owner or lessee shall mail the exemption application and a copy of the vehicle registration to the director within the time period specified in paragraph (E)(1)(b) of this rule

(5) Vehicles exempt under paragraph (C)(11) of the rule do not require registration under section 4503.10 of the Revised Code

(E)(1) The director may grant administrative exemptions or extensions of the inspection period where circumstances indicate such an exemption or extension is warranted and consistent with the intent of the program rules and regulations

(a) Such exemptions or extensions shall be requested, in writing, to the director on a form prescribed by the director. This form shall be available at all class A inspection stations

(b) Requests for exemptions or extensions must be received no later than thirty days prior to the end of the vehicle owner's inspection period

(c) The director shall reply to the request for exemption or extension within fourteen days.

(d) Any vehicle owner receiving an exemption or extension shall comply with any term or condition specified in the exemption or extension certificate

(2) Students whose legal residence and vehicle registration are in the inspection counties but also have established semi-permanent residence at their out-of-state school and therefore do not drive within the inspection area more than two months in a given year, may apply for an annual exemption certificate for the vehicle, on a form prescribed by the director

(F) The owner of any motor vehicle that is required to be inspected under the provisions of this rule but that is leased to another person, may include in the lease agreement provisions by which the lessee may have the vehicle inspected and obtain an inspection certificate on behalf of the owner

(G) Except for fleet self-inspected vehicles, the vehicle owner or lessee shall, at the time of the inspection, pay the licensee an inspection or reinspection fee of five dollars for each vehicle inspected.

(H) The owner of lessee shall present the vehicle registration or title to the certified inspector, so as to verify the vehicle identification number

(I) If the motor vehicle passes the anti-tampering inspection, the licensee shall provide the owner or lessee an inspection compliance certificate, signed by a certified inspector. Any inspection compliance certificate issued by a licensee shall be valid only for the vehicle owners forthcoming annual registration renewal month

(J) The motor vehicle owner shall present to the registrar an inspection compliance certificate issued by a licensed inspection station or an exempt vehicle certificate issued by the director, with an application for vehicle registration or preregistration as determined under section 4503.10 of the Reversed Code.

(K) If the vehicle fails its annual anti-tampering inspection, the licensee shall provide the owner or lessee an inspection certificate indicating failure of all or part of the vehicle inspection components to be replaced, and provide information outlining the appeal procedure in paragraph (L) of this rule. The owner or lessee shall:

(1) Make the repairs necessary to enable the vehicle to pass the anti-tampering inspection. Only new original or new aftermarket manufacturer's specification emission control equipment and specifcally United States environmental protection agency certified non-original aftermarket cataytic converters are acceptable for emission control equipment repair or replacement required under this chapter. The director may establish a list of approved emission control replacement parts;

(2) Have the vehicle reinspected at any licensed inspection station after the required repairs have been performed; and

(3) Present a dated repair or sales receipt for the repair or replacement of any item causing the failure of the vehicle, and present the failure certificate, before the vehicle will be reinspected.

(L) If a vehicle has failed its initial anti-tampering inspection, the vehicle owner or lessee shall have fourteen calendar days to appeal the results of the inspection to the Ohio environmental protection agency, in writing, on a form prescribed by the director, to be available at all licensed inspection stations.

(1) Upon notice of request for an appéal, the director or his representative shall contact the owner or lessee and will reinspect the vehicle at a place and time of the director's convenience.

(2) The director's determination of the vehicle's compliance or noncompliance with inspection standards shall be final.

(a) If, upon reinspection by the director or his representative, the vehicle still does not pass, another fail certificate shall be issued and an additional five-dollar inspection fee will be charged to the vehicle owner or lessee

(b) If, upon reinspection by the director or his representative, the vehicle passes, a compliance inspection certificate shall be issued to the vehicle owner or lessee at no charge.

(M) If a vehicle owner or lessee loses an inspection certificate, the vehicle owner or lessee is required to have the vehicle reinspected at a license inspection station.

(N) Multi-fueled conversion vehicles are subject to the inspection requirements.

(O) To promote the use and development of less polluting alternative fuels, owners or lessees may request and the director may grant, possible exemption status for one hundred per cent propane, natural gas, neat-alcohol fueled vehicles, or experimental vehicles.

(P) 1980 and later vehicles having engine conversions performed prior to February 1, 1988 shall comply with the inspection requirements and possess all the emission control components as specified below

(1) All the motor vehicles meeting the criteria in paragraph (P) of this rule shall meet the manufacturer's emission control specifications for the vehicle model year or the manufacturer's emission control specifications for the engine block replacement year with the following provision.

Regardless of the emission control specification selected, all engine block conversions are required, at a minimum, without exception, to use unleaded fuel and to have the following emission controls system:

(a) Fuel inlet restrictor;

(b) catalytic converter; and

(c) Positive crankcase ventilation.

(2) The vehicle owner shall provide written proof of the engine block year and date of the engine conversion or date of vehicle purchase.

(3) Vehicles covered under paragraph (P) of this rule may include, but not be limited to, the following.

(a) Vehicles converted from diesel to gasoline power;

(b) Gasoline to gasoline engine conversions; and

(c) Vehicles registered as homemade or self-assembled kit cars.

(Q) 1980 and later vehicles having engine conversions performed after February 1, 1988 shall comply with the inspection requirements and possess all the emission control components as indicated by the vehicle identification number, make, and model year.

(R) 1980 and later foreign imported gray market vehicles must comply with the same inspection requirements as if the vehicle were manufactured to meet United States standards for emission controls.

(S) The motor vehicle owner or lessee shall maintain the integrity of all emission control systems and their associated engine components to allow these systems to function at their optimum efficiency. Maintenance items shall include, but not be limited to, an intact exhaust system free of exhaust leaks of any kind between the exhaust manifold and the catalytic converter.

3745-26-03 Inspection station licensing procedure

(A) The director shall determine the maximum number of inspection stations per county to be licensed under this program. The director shall evaluate economic, administrative, and contractual factors in determining this number. The director may reevaluate this number at any time.

(B) The director shall classify and license inspection stations as either "class A" or "class B" inspection stations, as defined in rule 3745-26-01 of the Administrate Code.

(C) Provided the number of licenses allocated by the director for the applicable county has not been exceeded, the director may issue an inspection station license, valid for a one-year period, to an applicant who meets the following requirements:

(1) Submission of a complete application on a form prescribed by the director;

(2) Payment of a nonrefundable fee of one hundred dollars for each initial license or fifty dollars for each renewal license;

(a) Provided the number of licenses allocated by the director for the applicable county has been exceeded, the one-hundred-dollar application fee shall be returned to the applicant.

(b) Any applicant whose application and fee has been returned shall be placed on a waiting list and shall be notified by the director of the next opportunity to submit an application for that county

(3) Sign a notarized contract with the director stating the applicant will, to the best of its ability, execute and fulfill all obligations and responsibilities of this chapter an state the applicant will obtain a statement of insurance in an amount sufficient to cover replacement cost of inspection equipment provided by the director The contract shall be in a form prescribed by the director

(a) The applicant shall provide proof of the statement of insurance to the director or his authorized representative. The insurance document must include the insurance company's name, address, telephone number, and the name of the insurance agent.

(b) No inspection equipment provided by the director shall be installed at an inspection station until proof of the statement of insurance is presented to the director or his authorized representative. Licensed inspection stations shall maintain insurance coverage at all times throughout its participation as a licensed inspection station. Licensed inspection stations shall provide proof of continued insurance coverage upon any license renewal.

(4) A demonstration, during an on-site inspection by a designee of the director, of compliance with the requirements of the chapter.

(D) For applicants which meet the criteria for licensing as an inspection station the director shall issue an initial license to the facility for a period not to exceed two years. The director shall designate an annual renewal month for each license issued. Each license renewal shall be for a one-year period. The license shall be valid only for the owner in whose name the license is issued and for transaction of business for the purpose of this chapter, and for the location designated thereon.

(E) The director shall provide copies of the "Inspection Procedures Manual" and the official sign to be posted at licensed inspection stations. Class B inspection stations shall not be required to post the official inspection station sign

(F) Submittal of an initial licensing application and payment of the required fee shall authorize the applicant to send three personnel including the station manager to the required inspectors training course at no charge to the applicant On a form prescribed by the director applicants and licensees may request attendance of additional personnel at a fee sufficient to cover the costs of the training materials not to exceed fifteen dollars per employee.

(G) The director may include terms and conditions as part of any license issued to ensure compliance with this chapter

3745-26-04 Licensed inspection station requirements and obligations

(A) A licensed inspection station shall be geographically located within Hamilton Butler Cuyahoga Lake or Lorain county or any contiguous county

(B) A licensed inspection station shall meet the following building and space requirements

(1) Each station shall be an enclosed permanent structure in good repair and except for fleet stations be easily accessible to the public Temporary structures such as tents sheds or mobile vehicles are not acceptable

(2) The floor surface must be hard and smooth such as concrete) in good repair and must be kept clean and free from excess grease dirt and other loose material Dirt or gravel floors are not acceptable

(3) Designated inspection areas must be located entirely within the enclosed structure and shall be an area of no less than twelve feet by twenty feet Other business transactions are permitted within the designated inspection areas

(4) If a licensed inspection station has more than one interior inspection area each must meet the stated building and space requirements.

(5) Have a hoist floor jacks or pit available

(C) A licensed inspection station shall meet the following manpower requirements.

(1) Each inspection station shall have a minimum of two certified inspectors as certified in accordance with rule 3745-26-06 of the Administrative Code one of whom shall be a supervisor or manager at the licensed inspection station Fleet inspection stations shall have at least one certified inspector The licensee shall immediately notify the director, in writing when an employee, who is a certified inspector, resigns or is dismissed from em-

OKLAHOMA

OKLAHOMA MOTOR VEHICLE EMISSIONS INSPECTION ACT

Oklahoma Statutes Annotated, Title 47 — Motor Vehicles, Chapter 70 — Mechanical Inspection, Sec. 856 — Emission Control Equipment Inspections Exemptions; Enacted by Laws of 1984, Chapter 271; Amended by Laws of 1985, Ch. 158)

Administering Agency: **Commission of Public Safety**
3600 N. Eastern
Oklahoma City, Oklahoma 73111

§856.1 A.1. On and after January 1, 1987, any person who owns and drives a motor vehicle as that term is defined by the Motor Vehicle License and Registration Act, and resides within a county with a population of five hundred thousand (500,000) or more according to the 1980 Federal Decennial Census where there exists a U.S. Environmental Protection Agency designated air quality nonattainment area for auto-related pollutants, or resides within a twenty-five (25) mile radius of the centroid of the area of such a county, shall have said vehicle inspected within that area and shall maintain on the vehicle in good working order the federally required emission control equipment required by the Commissioner of Public Safety pursuant to recommendations of the State Department of Health. When any portion of a municipality is included within said twenty-five (25) mile radius, the entire municipality shall be subject to the provisions of this act.

2. On and after January 1, 1986, any person who owns and drives a motor vehicle as that term is defined by the Motor Vehicle License and Registration Act, and resides within a county with a population of less than five hundred thousand (500,000) according to the 1980 Federal Decennial Census where there exists a U.S. Environmental Protection Agency designated air quality nonattainment area for auto-related pollutants, or resides within a metropolitan transportation study area as that term is defined by the Department of Transportation and approved by the United States Department of Transportation which includes said county, shall have said vehicle inspected within that area and shall maintain on the vehicle in good working order the federally required emission control equipment required by the Commissioner of Public Safety pursuant to recommendations of the State Department of Health. When any portion of a municipality is included within said metropolitan transportation study area, the entire municipality shall be subject to the provisions of this act.

B. The Commissioner of Public Safety shall require a visual inspection of the federally required emission control equipment required on vehicles by the provisions of subsection A of this section in counties where there exists a U.S. Environmental Protection Agency designated air quality nonattainment area for auto-related pollutants.

C. In addition to the vehicle mechanical equipment required to be inspected pursuant to the provisions of Section 856 of Title 47 of the Oklahoma Statutes, each person operating an official inspection station shall visually inspect the original manufacturer's automotive emission control equipment or proper replacements for said equipment installed on vehicles when required by the Commissioner of Public Safety pursuant to the provisions of subsection B of this section.

D. Any inspection of automotive emission control equipment required pursuant to the provisions of this section shall apply to emission control equipment installed on vehicles of a model year required by the Commissioner of Public Safety pursuant to recommendations of the State Department of Health as is necessary to accommodate the resolution of the defined air pollution problem of the specific nonattainment area.

E. The provsions of this section shall not be construed to apply to:

1. trucks or truck-tractors owned and operated by one or more farmers and used primarily for farm use, and not for commercial or industrial purposes, or trucks or truck-tractors used primarily for the transportation of logs, ties, stave bolts, and posts direct from the forest to mill, first market, or railroad shipping points, which are licensed pursuant to law; or

2. motor vehicles or motor vehicle engines for which liquefied petroleum gas is used as a fuel.

Published by THE BUREAU OF NATIONAL AFFAIRS, INC., Washington, D.C. 20037

§ 856.2 The Commissioner of Public Safety shall make necessary rules and regulations for the administration and enforcement of this act pursuant to recommendations of the State Department of Health.

§ 856.3. The State Department of Health shall conduct a study of commuter traffic from suburban communities which impacts nonattainment areas. A written report of said study shall be presented to the President Pro Tempore of the Senate and the Speaker of the House of Representatives on or before January 2, 1985. Said report shall include recommendations as to additional areas which should be included in the emission control inspection program.

§ 856.4 A. Vehicles rejected for any item during the vehicle emission inspection shall have thirty (30) calendar days in which to correct such defect. Such vehicle may be presented for reinspection one time to the original inspection station for reinspection of an item or items, rejected.

B. When a vehicle has been rejected for any item during the vehicle emission inspection, the owner shall have seven (7) days to appeal such rejection to the Department of Public Safety, Vehicle Inspection Division in writing. Such appeal shall be resolved prior to the thirty (30) calendar days allowed on the rejection certificate. The Department shall inspect the appealed item or items and the finding of the Department shall be final.

§ 856.5 The Department of Public Safety shall furnish to every official vehicle inspection station required to perform the emission control inspection pursuant to the provisions of Section 856.1 of Title 47 of the Oklahoma Statutes, all equipment, supplies and inspection stickers required for the emission control inspection without cost to such station. Official vehicle inspection stations performing the mechanical inspection and the emission control inspection pursuant to the provisions of Sections 851 through 860 of Title 47 of the Oklahoma Statues shall retain as compensation all of the five-dollar fee provided for in Section 858 of Title 47 of the Oklahoma Statutes.

OREGON

(b) Alternate disposal methods are reasonably available to a substantial majority of the population in the affected area.

(3)(a) Nothing in this section prevents a local government from taking any of the following actions if that governmental entity otherwise has the power to do so:

(A) Prohibiting residential open burning;

(B) Allowing residential open burning on fewer days than the number of days on which residential open burning is authorized by the commission; or

(C) Taking other action that is more restrictive of residential open burning than a rule adopted by the commission under this section.

(b) Nothing in this section affects any local government ordinance, rule, regulation or provision that:

(A) Is more restrictive of residential open burning than a rule adopted by the commission under this section; and

(B) Is in effect on the effective date of this 1981 Act.

(c) As used in this subsection, "local government" means a city, county, other local governmental subdivision or a regional air quality control authority established under ORS 468.505.

MOTOR VEHICLE POLLUTION CONTROL

468.360 Definitions for ORS 468.360 to 468.405. As used in ORS 468.360 to 468.405:

(1) "Certified system" means a motor vehicle pollution control system for which a certificate of approval has been issued under ORS 468.375(3).

(2) "Factory-installed system" means a motor vehicle pollution control system installed by the manufacturer which meets criteria for emission of pollutants in effect under federal laws and regulations applicable on September 9, 1971, or which meets criteria adopted pursuant to subsection ORS 468.375(1), whichever criteria are stricter.

(3) "Motor vehicle" includes any self-propelled vehicle used for transporting persons or commodities on public roads and highways, but does not include a vehicle of special interest as that term is defined in ORS 801.605, if the vehicle is maintained as a collector's item and used for exhibitions, parades, club activities and similar uses but not used primarily for the transportation of persons or property.

(4) "Motor vehicle pollution control system" means equipment designed for installation on a motor vehicle for the purpose of reducing the pollutants emitted from the vehicle, or a system or engine adjustment or modification which causes a reduction of pollutants emitted from the vehicle.

468.365 Legislative findings. For purposes of ORS 468.360 to 468.405, the Legislative Assembly finds:

(1) The the emission of pollutants from motor vehicles is a significant cause of air pollution in may portions of this state.

(2) That the control and elimination of such pollutants are of prime importance for the protection and preservation of the public health, safety and well-being and for the prevention of irritation to the senses, interference with visibility, and damage to vegetation and property.

(3) That the state has a responsibility to establish procedures for compliance with standards which control or eliminate such pollutants.

(4) That the Oregon goal for pure air quality is the achievement of an atmosphere with no detectable adverse effect from motor vehicle air pollutant on health, safety, welfare and the quality of life and property.

468.370 Motor vehicle emission and noise standards; copy to Motor Vehicles Division. (1) After public hearing and in accordance with the applicable provisions of ORS chapter 183, the commission may adopt motor vehicle emission standards. For the purposes of this section, the commission may include, as a part of such standard, any standards for the control of noise emissions adopted pursuant to ORS 467.030.

(2) The commission shall furnish a copy of standards adopted pursuant to this section to the Motor Vehicles Division and shall publish notice of standards in a manner reasonably calculated to notify affected members of the public.

468.375 Certification of motor vehicle pollution control systems and inspection of motor vehicles. The commission shall:

(1) Determine and adopt by rule criteria for certification of motor vehicle pollution control systems. In determining the criteria the commission shall consider the following:

(a) The experience of any other state or the Federal Government;

(b) The cost of the system and of its installation;

(c) The durability of the system;

(d) The ease of determining whether the system, when installed on motor vehicle, is functioning properly; and

(e) Any other factors which, in the opinion of the commission, render such a system suitable for the control of motor vehicle air pollution or for the protection of the health, safety and welfare of the public.

(2) Prescribe by rule the manner in which a motor vehicle pollution control system shall be tested for certification. However, no such rule shall require testing for certification more often than once during the period for which registration or renewal of registration for a motor vehicle is issued. No rule shall require testing for certification of a motor vehicle that is exempted from the requirement for certification under ORS 816.300.

(3) Issue certificates of approval for classes of motor vehicle pollution control systems which, after being tested by the commission or by a method acceptable to the commission, the commission finds meet the criteria adopted under subsection (1) of this section.

(4) Designate by rule classifications of motor vehicles for which certified systems are available.

(5) Revoke, suspend or restrict a certificate of approval previously issued upon a determination that the system no longer meets the criteria adopted under subsection (1) of this section pursuant to procedures for a contested under ORS chapter 183.310 to 183.550.

(6) Designate suitable methods and standards for testing systems and inspecting motor vehicles to determine and insure compliance with the standards and criteria established by the commission.

(7) Except as provided in ORS 468.377, contract for the use of or the performance of tests or other services within or without the state.

468.377 Cost effective inspection program; contracts for inspections. The commission shall determine the most cost effective method of conducting a motor vehicle pollution control system inspection program as required by ORS 468.375. Upon finding that savings to the public and increased efficiency would result and the quality of the program would be adequately maintained, the commission may contract with a unit of local government or with a private individual, partnership or corporation authorized to do business in the State of Oregon, for the performance of tests or other services associated with conducting a motor vehicle pollution control system inspection program.

468.380 Notice to state agencies concerning certifications. The department shall notify the Motor Vehicles Division and the Oregon State Police whenever certificates of approval for motor vehicle pollution control systems are approved, revoked, suspended or restricted by the commission.

468.385 [Repealed by Laws of 1983 Chapter 338]

468.390 Licensing of personnel and equipment; certification of motor vehicles.

(1) The commission by rule may:

(a) Establish criteria and examinations for the qualification of persons eligible to inspect motor vehicles and motor vehicle pollution control systems and execute the certificates ORS 815.310 described under and for the procedures to be followed in such inspections.

(b) Establish criteria and examinations for the qualification of equipment, apparatus and methods used by persons to inspect motor vehicle and motor pollution control systems.

(c) Establish criteria and examinations for the testing of motor vehicles.

(2) Subject to rules of the commission, the department shall:

(a) Issue licenses to any person, type of equipment, apparatus or method qualified pursuant to subsection (1) of this section.

(b) Revoke, suspend or modify licenses issued pursuant to paragraph (a) of this subsection in accordance with the provisions of ORS chapter 183.310 to 183.550 relating to contested cases.

(c) Issue certificates of compliance for motor vehicles which, after being tested in accordance with the rules of the commission, meet the criteria established under subsection (1) of this section and the standards adopted pursuant to ORS 468.360 to 468.395 and 468.405.

468.395 Determination of compliance of motor vehicles. (1) The commission shall establish and maintain procedures and programs for determining whether motor vehicles meet the minimum requirements necessary to secure a certificate under ORS 815.310.

(2) Such procedures and programs include, but are not limited to, the installation of a certified system and the adjustment, tune-up, or other mechanical work performed on the motor vehicle in accordance with the requirements of the commission.

468.397 Designation of areas of the state subject to motor vehicle emission inspection program. (1) If the need for a motor vehicle pollution control system inspection program is identified for an area in the State of Oregon Clean Air Act Implementation Plan, then the Environmental Quality Commission, by rule, shall designate boundaries, in addition to the areas specified in ORS 815.300(2)(a) and (b), within which motor vehicles are subject to the requirement under ORS 815.300 to have a certificate of compliance issued under ORS 468.390 to be registered or have the registration of the vehicle renewed.

(2) Whenever the Environmental Quality Commission designates boundaries under this section within which vehicles are subject to the requirements of ORS 815.300, the commission shall notify the Motor Vehicles Division of the Department of Transportation and shall provide the division with information necessary to perform the division's duties under ORS 815.300.

468.400 Bond; remedy against person licensed under ORS 468.390; cancellation of license. (1) Any person licensed to issue certificates of compliance pursuant toORS 468.390 shall file with the department a surety bond. The bond shall be executed to the State of Oregon in the sum of $1,000. It shall be approved as to form by the Attorney General, and shall be conditioned that inspections and certifications will be made only by persons who meet the qualifications fixed by the commission and will be made without fraud or fraudulent representations and without violating any of the provisions of ORS 468.360 to 468.405, 815.310, 815.320, 815.325, 816.295 and 816.300.

(2) In addition to any other remedy that a person may have, if any person suffers any loss or damage by reason of the fraud, fraudulent representations or violation of any of the provisions of ORS 468.360 to 468.405, 815.310, 815.320, 815.325, 816.295 and 816.300 by a person licensed pursuant to ORS 468.390, the injured person has the right of action against the business employing such licensed person and a right of action in the person's own name against the surety upon the bond.

(3) The license issued pursuant to ORS 468.390 of any person whose bond is canceled by legal notice shall be canceled immediately by the department. If the license is not renewed or is voluntarily or involuntarily canceled, the sureties of the bond shall be relieved from liability accruing subsequent to such cancellation by the department.

468.405 Fees; collection; use. (1) The department shall:

(a) Establish and collect fees for application, examination and licensing of persons, equipment, apparatus or methods in accordance with ORS 468.390.

(A) The fee for licensing shall not exceed $5.

(B) The fee for renewal of licenses shall not exceed $1.

(b) Establish fees for the issuance of certificates of compliance. The department may classify motor vehicles and establish a different fee for each such class. The fee for the issuance of certificates shall be established by the commission in an amount based upon the costs of administering this program established in the current biennial budget. The fee for a certificate shall not exceed $10.

(2) The department shall collect the fees established pursuant to paragraph (b) of subsection (1) of this section at the time of the issuance of certificates of compliance as required by ORS 468.390(2)(c).

(3) On or before the 15th day of each month, the commission shall pay into the State Treasury all moneys received as fees pursuant to subsections (1) and (2) of this section during the preceding calendar month. The State Treasurer shall credit such money to the Department of Environmental Quality Motor Vehicle Pollution Account, which is hereby created. The moneys in the Department of Environmental Quality Motor Vehicle Pollution Account are continuously appropriated to the department to be used by the department solely or in conjunction with other state agencies and local units of government for:

(a) Any expenses incurred by the department and, if approved by the Governor, any expenses incurred by the Motor Vehicles Division of the Department of Transportation in the certification, examination, inspection or licensing of persons, equipment, apparatus or methods in accordance with the provisions of ORS 468.390 and 815.310.

(b) Such other expenses as are necessary to study traffic patterns and to inspect, regulate and control the emission of pollutants from motor vehicles in this state.

(4) The department may enter into an agreement with the Motor Vehicles Division of the Department of Transportation to collect the licensing and renewal fees described in paragraph (a) of subsection (1) of this section subject to the fees being paid and credited as provided in subsection (3) of this section.

468.410 Authority to limit motor vehicle operation and traffic. The commission and regional air pollution control authorities organized pursuant to ORS 448.305, 454.010 to 454.040, 454.205 to 454.255, 454.405, 454.425, 454.505 to 454.535, 454.605 to 454.745 and this chapter by rule may regulate, limit, control or prohibit motor vehicle operation and traffic as necessary for the control of air pollution which presents an imminent and substantial endangerment to the health of persons.

468.415 Administration and enforcement of rules adopted under ORS 468.410. Cities, counties, municipal corporations and other agencies, including the Department of State Police and the Highway Division, shall cooperate with the commission and regional air pollution control authorities in the administration and enforcement of the terms of any rule adopted pursuant to ORS 468.410.

468.420 Police enforcement. The Oregon State Police, the county sheriff and municipal police are authorized to use such reasonable force as is required in the enforcement of any rule adopted pursuant to ORS 468.410 and may take such reasonable steps as are required to assure compliance therewith, including but not limited to:

(1) Locating appropriate signs and signals for detouring, prohibiting and stopping motor vehicle traffic; and

(2) Issuing warnings or citations.

FIELD BURNING REGULATION

468.450 Regulation of field burning on marginal days. (1) As used in this section:

(a) "Marginal conditions" means atmospheric conditions such that smoke and particulate matter escape into the upper atmosphere with some difficulty but not such that limited additional smoke and particulate matter would constitute a danger to the public health and safety.

(b) "Marginal day" means a day on which marginal conditions exist.

(2) In exercising its functions under ORS 476.380 and 478.960, the commission shall classify different types or combinations of atmospheric conditions as marginal conditions and shall specify the extent and types of burning that may be allowed under different combinations of atmospheric conditions. A schedule describing the types and extent of burning to be permitted on each type of marginal day shall be prepared and circulated to all public agencies responsible for providing information and issuing permits under ORS 476.380 and 478.960. The schedule shall give first priority to the burning of perennial grass seed crops used for grass seed production, second priority to annual grass seed crops used for grass seed production, third priority to grain crop burning, and fourth priority to all other burning and shall prescribe duration of periods of time during the day when burning is authorized.

(3) In preparing the schedule required under subsection (2) of this section, the commission shall weigh the economic consequences of scheduled burnings and the feasibility of alternative actions, and shall consider weather conditions and other factors necessary to protect the public health and welfare.

(4) None of the functions of the commission under this section or under ORS 476.380 or 478.960, as it relates to agricultural burning, shall be performed by any regional air quality control authority established under ORS 468.505.

468.453 Definitions for ORS 468.455 to 468.490. As used in ORS 468.455 to 468.490:

(1) "Smoke management" means the daily control of the conducting of open field burning to such times and places and in such amounts so as to provide for the escape of smoke and particulate matter therefrom into the atmosphere with minimal intrusion into cities and minimal impact on public health and in such a manner that under existing meteorological conditions a maximum number of acres registered can be burned in a minimum number of days without substantial impairment of air quality.

(2) "Smoke management program" means a plan or system for smoke management. A smoke management program shall include, but not be limited to, provisions for:

(a) Annual inventorying and registering, prior to the burning season, of agricultural fields for open field burning;

(b) Preparation and issuance of field burning permits by affected governmental agencies;

(c) Gathering and disseminating regional and sectional meteorological conditions on a daily or hourly basis;

(d) Scheduling times, places and amounts of agricultural fields that may be open burned daily or hourly, based on meteorological conditions during the burning season;

(e) Conducting surveillance and gathering and disseminating information on a daily or more frequent basis;

(f) Effective communications between effected personnel during the burning season; and

(g) Employment of personnel to conduct the program.

468.455 Policy. In the interest of public health and welfare it is declared to be the public policy of the state to control, reduce and prevent air pollution caused by the practice of open field burning. Recognizing that open field burning is a nontraditional area source of air pollution that is not confined to a single point of emission and recognizing that limitation or bar of the practice at this time, without having found reasonable and economically feasible alternatives to the practice could seriously impair the public welfare, the Legislative Assembly declares it to be the public policy of the state to reduce air pollution from open field burning by smoke management and to continue to seek and encourage by research and development reasonable and economically feasible alternatives to the practice of annual open field burning, all consistent with ORS 468.280.

468.458 Permits for field burning; delegation of duty to deliver permits. (1) On and after January 1, 1975, permits for open burning of perennial grass seed crops, annual grass seed crops and cereal

PENNSYLVANIA

PENNSYLVANIA VEHICLE EMISSION INSPECTION RULES

(Pennsylvania Code, Title 67 — Transportation, Chapter 177 — Emission Inspection Program; Adopted December 21, 1979; Amended November 5, 1983; September 1, 1984; March 5, 1988; March 26, 1988)

GENERAL PROVISIONS

177.1. Purpose.

This chapter implements 75 Pa.C.S. §§4531, 4701, 4702, 4706, 4700 and 4721.

177.2a. Application of equipment rules.

Equipment rules apply to subject vehicles operated on a highway, unless specifically exempted by this chapter.

177.3. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

Antique motor vehicle — A motor vehicle, bearing an antique motor vehicle registration plate, but not a reproduction thereof, manufactured more than 25 years prior to the current year which has been maintained in or restored to a condition which is substantially in conformance with manufacturer specifications.

Approved exhaust emission analyzer — An instrument, developed for measuring the hydrocarbon, carbon monoxide, and carbon dioxide emissions from the exhaust system of a vehicle, which meets required emission analyzer specifications and program requirements and has been approved by the Department under §177.35 (relating to tools and equipment).

BAR 80 — The acronym used for the Califorina Bureau of Automotive Repair's "Exhaust Gas Analyzer Specifications: 1979" provided in 1980 for the testing and documentation of technical specifications required for the approval of analyzer use in California for the measurement of hydrocarbon and carbon monoxide emissions. These specifications — including performance criteria, design characteristics, instrument evaluation procedures and documentation, warranty requirements, and logistics — must be met or surpassed for an analyzer to be approved for use in the Commonwealth's Emission Inspection/Maintenance (I/M) Program. Copies of the BAR 80 specifications may be obtained from the Department of Consumer Affairs, Bureau of Automotive Repair, California Vehicle Inspection Program, 3116 Bradshaw Road, Sacramento, California 95827. A fee for this document may be required.

Bureau — The Bureau of Motor Vehicles of the Department.

Business day — Each day in which an appointed emission inspection station is open for business, excluding Sundays and State holidays.

Certificate of emission inspection — A serially numbered sticker indicating that a vehicle has passed inspection under this chapter.

Certificate of waiver — An official Department document indicating that the requirement of passing reinspection has been waived for a vehicle under §177.40 (relating to certificates of waiver).

Certified emission inspection mechanic — A person who holds a valid certification card designated for emissions, issued by the Bureau certifying that the person is qualified and has passed the requirements to perform emission inspections on subject vehicles in an appointed emission inspection station.

Classic motor vehicle — A motor vehicle, bearing a classic motor vehicle registration plate, but not a reproduction thereof, which is a self-propelled vehicle, manufactured more than ten years prior to the current year and, because of discontinued production and limited availability, determined by the Department to be a model or make of significant value to collectors or exhibitors and which has been maintained in or restored to a condition which is substantially in conformity with manufacturer specifications and appearance.

Commonwealth emission inspection station — An inspection station appointed to conduct emission inspections on subject vehicles owned by and engaged exclusively in the performance of the official duties of the Federal Government, the Commonwealth or a political subdivision of the Commonwealth.

Consumer complaint emission inspection station — An inspection station, operated by Department designated officials, appointed for the purpose of:

(i) Providing a facility where owners of failed subject vehicles with emission inspetion consumer complaints may bring their vehicles for an independent case review, reinspection, if necessary, and issuance of a certificate of emission inspection.

(ii) Providing Department facilities to maintain regional program efforts.

Department — The Department of Transportation of the Commonwealth.

Designated area — The geographic area which the Department has identified as an emission I/M program designated area. Copies of the designations are available upon request from the Department.

Emission inspection — The testing of the exhaust emissions of a subject vehicle for carbon monoxide and hydrocarbons, as required by Department procedures, while its engine is operating in an idle mode.

Emission Inspection Section — The Emission Inspection Section of the Vehicle Control Division within the Bureau.

Field certified exhaust emission analyzer — An approved exhaust emission analyzer certified by the manufacturer or distributor as being properly calibrated at the emission station according to the manufacturer's specifications and Department procedures and capable of properly recording test data.

Fleet emission inspection station — An inspection station appointed to inspect a minimum of 15 subject vehicles, space permitting, leased or owned and registered in the name of the person in whose name the certificate of appointment is issued.

General emission inspection station — An inspection station appointed to conduct emission inspections on subject vehicles.

Gross vehicle weight rating (GVWR) — The value specified on the Federal weight certification label by the manufacturer as the loaded weight of a single vehicle.

I/M indicator tab (for safety certificate of inspection) — A tab containing an indicator in the background to be affixed to the safety certificate of inspection to indicate a requirement for an emission I/M inspection.

I/M monthly tab (for emission certificate of inspection) — A tab to be affixed to the emission certificate of inspection to show the expiration date of the current emission I/M inspection.

I/M registration credit tab — A tab accompanying the certificate of inspection to be used by eligible residents to apply for registration credit.

I/M registration indicator — An indicator on the registration card which identifies the vehicle as a subject vehicle which shall be emission inspected annually.

Implement of husbandry — A vehicle designed or adapted and determined by the Department to be used exclusively for agricultural operations and only incidentally operated or moved upon highways.

Inspection area — The area in which all emission inspections shall be conducted.

Inspection station investigator — A person designated by the Department to investigate, inspect and supervise the operations of general, fleet, consumer complaint and Commonwealth emission inspection stations.

Limited fleet inspection periods — Inspection periods in which approved fleet owners/lessors are required to emission inspect their vehicles, specified in the Application for Fleet Stations form.

Residency exemption — An official Department document stating that a residency exemption application has been verified and approved and that the vehicle listed is exempt from an emission inspection.

Residency exemption application — An official Department document used to apply for an exemption from emission inspection to be completed by residents residing outside the designated emission I/M program areas, but who incorrectly received an I/M indicator on their registration card.

Secretary — The Secretary of the Department of Transportation of the Commonwealth.

Special mobile equipment — Vehicles not designed or used primarily for the transportation of persons or property and only incidentally operated or moved over a highway, including but not limited to: ditch digging apparatus, well boring apparatus; earth moving and road construction and maintenance machinery, such as asphalt spreaders, bituminous mixers, bucket loaders, snowplows, ditchers, graders, finishing machines, road rollers, scarifiers, earth moving carryalls, scrapers, power shovels and draglines; and self-propelled cranes and tractors, other than truck tractors. The term does not include house trailers; dump trucks; truck-mounted transit mixers, cranes or shovels; or other vehicles designed for the transportation of persons or property to which machinery has been attached.

Street rod — A motor vehicle, but not a reproduction thereof, with a model year of 1948 or older which has been materially altered or modified by the removal, addition, or substitution of essential parts and with a gross weight or registered gross weight of not more than 9,000 pounds.

Subject vehicle — A gasoline powered vehicle with a gross vehicle weight rating of 11,000 pounds or less, moved upon a highway and registered in a designated area, except:

(i) Special mobile equipment.

(ii) Implements of husbandry.

(iii) Towed motor vehicles.

(iv) Motor vehicles being driven, or towed by an official inspection station owner or employe for the purpose of inspection.

(v) Classic or antique motor vehicles.

(vi) Motorcycles.

(vii) Motorized pedalcycles.

(viii) Motor driven cycles.

(ix) Street rods.

(x) Vehicles being repossessed by a financer or collector-repossessor through the use of miscellaneous motor vehicle registration plates.

(xi) New vehicles while they are in the process of manufacture, including testing, and not in transit from the manufacturer to a purchaser or dealer.

(xii) Military vehicle used for training by a private, nonprofit, tax exempt military educational institution when not traveling on public roads in excess of 1 mile and when the property on both sides of the public road is owned by the institution.

(xiii) School buses 11,001 pounds or more gross vehicle weight rating.

(xiv) Buses, other than school buses, with a seating capacity of 27 or more.

Vehicle Control Division — The division within the Bureau which administers vehicle equipment and inspection matters.

Vehicle emission inspection consumer report — A document automatically generated by an approved analyzer and completed by a certified emission inspection mechanic containing emission related inspection information provided to the owner of the subject vehicle.

Vehicle ID number — A combination of numbers or letters, or both, which the Department assigns to a vehicle for registration purposes. These numbers or letters can be found on the vehicle registration card in the block named "Title Number" or, if the title number is not available, use the Vehicle Identification Number (VIN) located on the registration document.

Vehicle year — The date of manufacture of the vehicle as specified by the Vehicle Identification Number (VIN), or, if this number is not available or cannot be interpreted for the year, the annual production period of the vehicle as designated by the manufacturer.

177.4. Annual inspection.

Subject vehicles shall be inspected annually in coordination with safety inspection according to procedures established by the Bureau.

177.5. Inspection of vehicles reentering this Commonwealth.

Vehicles subject to emission inspection which have been outside of this Commonwealth continuously for 30 days or more and which at the time of reentering this Commonwealth do not bear a currently valid certificate of emission inspection shall not be required to be inspected until 10 days after reentering this Commonwealth.

177.6. New or used vehicles after sale or resale.

(a) A new or used vehicle, after sale or resale, may be driven without a current inspection certificate for 5 days after the date of sale or resale or entry into this Commonwealth, whichever occurs later. The purchaser of the vehicle, unless contracted otherwise, assumes full responsibility for having the vehicle inspected.

(b) New or used vehicles, acquired after sale or resale, bearing a currently valid certificate of emission inspection may be driven on Commonwealth highways until the certificate of emission inspection expires.

177.7. Vehicles registered in nondesignated areas or another state.

A vehicle registered outside a designated area or another state may be inspected for emissions but may not be issued a certificate of emission inspection unless the certificate is specifically requested by a vehicle owner.

177.8. Vehicles requiring emission inspection due to change of address.

Subject vehicles required to participate in the Emission I/M Program because of vehicle registration change of address shall be phased into the emission inspection program during the time of the expiration of the current certificate of safety inspection.

177.9. Credit.

The I/M registration credit tab shall be given to every vehicle owner whose vehicle either passes the emission inspection or is given a waiver.

SPECIFIC REQUIREMENTS FOR OFFICIAL, GENERAL, FLEET AND COMMONWEALTH EMISSION INSPECTION STATIONS

177.21. Appointment.

(a) Authority. For the purpose of establishing a system of official emission inspection stations, the Bureau will issue certificates of appointment to facilities within this Commonwealth that comply with the Vehicle Code and this title. Official emission inspection stations are authorized to conduct emission inspections and issue official certificates of emission inspection.

(b) Certificate of appointment. The certificate of appointment for emission inspection stations will be issued only when the Bureau is satisfied that the station is properly equipped and employs certified emission mechanics to perform emission inspections. Only those stations fulfilling Department requirements and complying with this chapter will be issued an emission certificate of appointment. Prior involvement with a suspended inspection station may be sufficient cause to deny appointment. The emission certificate of appointment shall at all times be conspicuously displayed at the place for which issued. See 75 Pa. C.S. §4722 (relating to certificate of appointment).

(c) Certificate not assignable. A certificate of appointment for an emission inspection station shall not be assigned or transferred to another person or location and shall be valid only for the person in whose name it is issued and for transaction of business at the place designated therein.

(d) Valid certificate required. No person shall in any manner represent any place as an official general emission inspection station unless the station is operating under a valid certificate of appointment issued by the Bureau.

(e) Inspection stations with common access. An emission certificate of appointment will not be issued for operation of an official emission inspection station on a part of the premises of another official emission inspection station which utilizes the same access. This subsection does not apply where the inspection stations have separate internal accesses, though sharing a common external access.

(f) Suspended inspection stations. An emission certificate of appointment will not be issued for operation of an official emission inspection station on a part of the premises of an official emission inspection station which has been suspended if the owner of the suspended station continues to conduct any type of business which utilizes the same access. This subsection does not apply where the station and the other business each have a separate internal access, though sharing a common external access.

177.22. [Reserved].

177.23. [Reserved].

177.31. How to make application.

(a) Form. The applicant shall file one copy of the Official Emission Inspection Station Update/Official Emission Inspection Station Application with the Bureau. A separate application shall be made for each place of business.

(b) Bond or proof of insurance.

(1) An applicant for a certificate of appointment shall furnish a bond, on a form prescribed by the Department, or proof of insurance as required by 75 Pa.C.S. §4722(c) (relating to certificate of appointment).

(2) The bond or insurance shall be in the amount of $10,000 for each place of business and shall provide compensation to a vehicle owner for damage the vehicle may sustain while it is in possession of the emission inspection station.

(3) The bond or insurance shall be renewed each year.

(4) Cancellation of the bond or insurance shall automatically void the certificate of appointment. Inspections shall cease until the Bureau receives a new bond or proof of insurance.

(c) Specification of type. The application shall indicate the type of emission inspection station authorization applied for, that is, Commonwealth, consumer complaint, general or fleet.

(d) Applicant. The applicant shall be the owner of the business or, in the case of the corporation, some other person specifically authorized to sign the application:

(1) If a natural person, the applicant shall be at least 18 years of age.

(2) If the applicant is a corporation, copartnership or association, the application shall be signed by an officer, partner or associate, or some other person specifically authorized to sign the application.

(i) The person who signs the application shall be at least 18 years of age.

TEXAS

TEXAS REGULATION IV: CONTROL OF AIR POLLUTION FROM MOTOR VEHICLES

(Texas Administrative Code, Title 31, Natural Resources and Conservation, Part III, Air Control Board, Chapter 114 — Control of Air Pollution from Motor Vehicles; Adopted effective December 1, 1973; Amended effective April 16, 1981; December 31, 1983; June 1, 1984; January 1, 1986; November 27, 1986; January 6, 1989)

§114.1. Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions from Motor Vehicles.

(a) Any person owning or operating any motor vehicle or motor vehicle engine on which is installed or incorporated a system or device used to control emissions from the motor vehicle in compliance with federal motor vehicle rules shall maintain the system or device in good operable condition and shall use it at all times that the motor vehicle or motor vehicle engine is operated.

(b) No person may remove or make inoperable any system or device used to control emissions from a motor vehicle or motor vehicle engine or any part thereof, except where the purpose of removal of the system or device, or part thereof, is to install another system or device, or part thereof, which is equally effective in reducing emissions from the vehicle. Acceptable removal and/or installation practices include:

(1) Replacement of the engine of a vehicle if:

(A) The design of the replacement engine has received prior approval of the U.S. Environmental Protection Agency;

(B) The design of the replacement engine is compatible with the vehicle chassis such that all applicable pollution control system and devices are properly installed and operable; and

(C) The resulting vehicle is identical, with regard to all emission-related parts and emission-related engine design parameters and calibrations, to the same or a newer model year vehicle, as originally equipped.

(2) Replacement of a catalytic converter on a vehicle if:

(A) The replacement catalyst is an original equipment manufacturer's catalyst or an aftermarket catalyst accepted by the U.S. Environmental Protection Agency; and

(B) Conformance with (A) of this paragraph is documented during the inspection of the vehicle, or upon request.

(3) Replacement or installation of any other system or device if:

(A) The system or device can be demonstrated to be at least as effective in reducing emissions as original equipment; and

(B) Conformance with (A) of this paragraph is documented, upon request.

(c) No person may sell, offer for sale, lease, or offer to lease in the State of Texas any motor vehicle unless all of the following conditions are met:

(1) The motor vehicle shall be equipped with either the control systems or devices that were originally a part of the motor vehicle or motor vehicle engine or alternate control system or device as designated in subsection (b) of this section.

(2) The control systems or devices required in paragraph (1) of this subsection shall be in good operable condition.

(3) A notice of the prohibition and requirements of this subsection shall be displayed at all commercial motor vehicle sales facilities, vehicle consignment lots, and other businesses in Texas which sell, offer for sale, lease, or offer to lease more than three used vehicles per year. The notice shall be displayed in a conspicuous and prominent location near each customer entrance way and in each sales or lease office. The notice shall read, "State law prohibits any person from selling, offering for sale, leasing, or offering to lease any vehicle not equipped with all emission control systems or devices in good operable condition. Violators are subject to penalties under the Texas Clean Air Act of up to $25,000 per violation." This notice shall be no smaller than 8 inches by 10 inches (20.32 cm by 25.4 cm) and shall be clearly visible to all customers.

(d) Any part or component of an air pollution control system or device of a motor vehicle or motor vehicle engine equipped with such air pollution control system or device in compliance with federal motor vehicle rules shall not be replaced with a different part or component unless such part or component is designated as a replacement for the specific make and model of the vehicle or vehicle engine.

(e) No person may introduce leaded gasoline into a motor vehicle certified by the Environmental Protection Agency for use of unleaded gasoline. A notice of the prohibitions and requirements of this subsection shall be prominently displayed at all motor vehicle fuel dispensing facilities in Texas which dispense leaded gasoline. The notice shall be displayed in the immediate area of each gasoline pump island which provides leaded gasoline, and shall be posted in a prominent and conspicuous location. The notice shall read, "State law prohibits any person from introducing any gasoline containing lead into any motor vehicle certified for use of 'unleaded gasoline only'. Violators are subject to a penalty of up to $25,000 per violation." This notice shall be no smaller than 8 inches by 10 inches (20.32 cm by 25.4 cm) and shall be clearly visible from each refueling location.

(f) No person may sell, offer for sale, or use any system or device for the purpose of circumventing any system or device, or any part thereof, installed by a vehicle manufacturer to comply with the Federal Motor Vehicle Control Program. A notice of the prohibitions and requirements of this subsection shall be displayed at all motor vehicle parts, supply, repair, or service facilities in Texas which sell, offer for sale, install, or offer to install any vehicle emission control or exhaust system or device. The notice shall be displayed in a prominent and conspicuous location near each customer entrance way and service counter. The notice shall read, "State law prohibits any person from selling, offering for sale, or using any system or device for the purpose of circumventing any emission control device on a vehicle or vehicle engine. State law also prohibits any person from removing or disconnecting any part of the emission control system of a motor vehicle except to install replacement parts which are equally effective in reducing emissions. Violators are subject to penalties under the Texas Clean Air Act of up to $25,000 per violation." This notice shall be no smaller than 8 inches by 10 inches (20.32 cm by 25.4 cm) and shall be clearly visible to all customers.

§114.2. Reserved.

§114.3. Inspection Requirements.

(a) No person may operate any motor vehicle which does not comply with air pollution emission control related requirements included in the annual vehicle safety inspection requirements administered by the Texas Department of Public Safety as evidenced by a currently valid inspection certificate affixed to the vehicle windshield.

(b) No person may issue or allow the issuance of a vehicle inspection certification, as authorized by the Texas Department of public Safety, unless all air pollution emission control related requirements of the annual vehicle safety inspection are completely and properly performed in accordance with the rules and regulations adopted by the Texas Department of Public Safety. Prior to taking any enforcement action regarding this provision, the Texas Air Control Board shall consult with the Texas Department of Public Safety.

§114.4. Equipment Evaluation Procedures for Vehicle Exhaust Gas Analyzers.

(a) Any manufacturer or authorized distributor of vehicle testing equipment may apply to the Executive Director for approval of an exhaust gas analyzer or analyzer system for use in the Texas vehicle idle inspection/maintenance (I/M) program administered by the Texas Department of Public Safety (DPS). Each applicant must provide sufficient information regarding a specific analyzer or analyzer system to demonstrate conformance with the criteria set forth in "Specifications for Vehicle Exhaust Gas Analyzer Systems for Use in the Texas Vehicle Idle Emissions Inspection/Maintenance Program" revised October 14, 1988 which is herein adopted by reference. Copies of this document are available at the Texas Air Control Board central office, 6330 Highway 290 East, Austin, Texas, and at the DPS central office, 5805 North Lamar Boulevard, Austin, Texas.

(b) The conformance demonstration shall include, but is not limited to:

(1) Certification that equipment design and construction conforms with the specifications referenced in subsection (a),

(2) Documentation of successful results from appropriate performance testing,

(3) Evidence of necessary changes to internal computer programming, display format, and data recording sequence, and

(4) A commitment to fulfill all maintenance, repair, training, and other service requirements described in the specifications referenced in subsection (a). A copy of the minimum warranty agreement to be offered to the purchaser of an approved vehicle exhaust gas analyzer shall be included in the demonstration of conformance.

(c) If a review of the demonstration of conformance and all related support material indicates compliance with the criteria listed in subsections (a) and (b), the Executive Director may issue a notice of approval to the analyzer manufacturer which endorses the use of the specified analyzer or analyzer system in the Texas vehicle idle emission I/M program. A copy of this notice shall be submitted to the DPS for final authorization.

(d) The applicant shall comply with all special provisions and conditions specified by the Executive Director in the notice of approval.

(e) Any manufacturer or authorized distributor which receives a notice of approval from the Executive Director for a vehicle exhaust gas analyzer for use in the vehicle idle I/M program may be subject to appropriate enforcement action and penalties prescribed in the Texas Clean Air Act or the rules and regulations promulgated thereunder if:

(1) Any information included in the conformance demonstration as required in subsection (b) is misrepresented resulting in the purchase or operation of equipment in the vehicle idle I/M program which does not meet the specifications referenced in subsection (a), or

(2) The applicant fails to comply with any requirement or commitment specified in the notice of approval issued by the Executive Director or implied by the representations submitted by the applicant in the conformance demonstration required by subsection (b).

§114.5. Exclusions and Exceptions.

(a) The following exemptions shall apply to specified motor vehicles or motor vehicle engines:

(1) Motor vehicles or motor vehicle engines which are registered as farm vehicles with the Motor Vehicle Division of the Texas Department of Highways and Public Transportation and are intended solely or primarily for use on a farm or ranch; or are intended solely or primarily for legally sanctioned motor competitions, for research and development uses, or for instruction in a bona fide vocational training program where the use of a system or device would be detrimental to the purpose for which the vehicle or engine is intended to be used are exempt from the provisions of §114.1(a), (b), and (d) of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions From Motor Vehicles).

(2) Motor vehicles or motor vehicle engines intended solely or primarily for research and development uses, or for instruction in a bona fide vocational training program where the introduction of leaded gasoline or the circumvention of an emission control system or device is necessary for the intended purposes of the program are exempt from the provisions of §114.1(e) and (f) of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions From Motor Vehicles).

(b) Vehicles belonging to members of the U.S. Department of Defense (DOD) participating in the DOD Privately Owned Vehicle Import Program or other persons being transferred to a foreign country are exempt from the provisions of §114.1(a), (b), and (d) of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions from Motor Vehicles) if the following conditions are met:

(1) Only the catalytic converter, oxygen sensor, and/or the fuel filler inlet restrictor are removed from the vehicle.

(2) The vehicle is delivered to the appropriate port for overseas shipment within 30 days after the emission control device(s) is removed.

(3) If the vehicle is returned to the United States, all systems or devices used to control emissions from the vehicle are restored to good operable condition within 30 days of pick-up of the vehicle from the appropriate port of importation.

(4) Documentation shall be kept with the vehicle at all times while the vehicle is operated in Texas which provides sufficient information to demonstrate compliance with all appropriate qualifications and conditions of this exemption, including the following:

(A) The unique vehicle identification number (VIN) of the subject vehicle;

(B) The agency, company, or organization which employs the owner of the subject vehicle;

(C) The country to which the owner of the subject vehicle is being transferred;

(D) The dates when applicable alterations were performed on the subject vehicle;

(E) The date when the subject vehicle is scheduled to be delivered to the appropriate port for shipment out of the United States; and

(F) The date when the subject vehicle is picked up from the port of importation upon returning to the United States.

(c) The owner or operator of a vehicle equipped to operate on ethane, butane, propane, liquefied petroleum gas (LPG), or compressed natural gas (CNG) are exempt from the provisions of §114.1 of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions from Motor Vehicles) if the vehicle design precludes the use of gasoline, gasohol, or diesel fuel without modification or satisfies the requirements for dual-fuel conversions specified in the rules and regulations adopted by the Texas Department of Public Safety.

(d) Any person owning or operating a motor vehicle or motor vehicle engine may apply to the Executive Director for a waiver from the provisions of §114.1(a)(b) of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions from Motor Vehicles). Such a waiver may be granted if the following conditions are met:

(1) The application shall include the applicant's full name, business address, and telephone number. A single vehicle and vehicle engine shall be specified in the application and must be identified by the unique vehicle identification number assigned to that vehicle by the manufacturer and by the manufacturer's engine family number.

(2) The air pollution control systems or devices on the vehicle or vehicle engine which would be covered by the waiver shall be specified in the application.

(3) A demonstration shall be made in the application that provides adequate justification for special consideration of the specified vehicle under the provisions of Regulation IV. This demonstration shall include, but shall not be limited to, the following information necessary to determine that the use of certain pollution control devices or systems on the vehicle to be covered by the waiver would result in a clear danger to persons or property or would be detrimental to the purpose for which the vehicle is intended to be used.

(A) Proposed use of the vehicle and description of adverse circumstances;

(B) Locations where the vehicle will primarily be operated;

(C) Estimated length of time the vehicle is expected to be operated in adverse circumstances;

(D) Estimated percentages of the time the vehicle will primarily be operated in adverse circumstances and on public roadways;

(E) History of problems related to the use of specified control devices or systems;

(F) Evidence of the potential hazards and consequences of operating the vehicle for the intended use with the identified control devices or systems in place.

(4) The applicant shall agree and ensure that a copy of the waiver shall be kept with the vehicle at all times and shall be available for inspection by representatives of the Texas Air Control Board, the Texas Department of Public Safety or any other law enforcement agency upon request. The approved waiver shall also be presented to the certified vehicle inspector before each annual vehicle safety inspection of the vehicle as administered by the Texas Department of Public Safety.

(5) The applicant shall agree and ensure that the waiver shall be void and all pollution control systems and devices replaced on the vehicle and/or engine covered by the waiver when the vehicle changes ownership or is no longer used for the purpose identified in the waiver application. The Executive Director shall be informed in writing prior to the change of ownership or usage.

(6) The applicant shall comply with all special provisions and conditions specified by the Executive Director in the waiver.

(e) The following vehicle transactions involving "wholesale dealers" and retail "dealers" as defined in the Texas Dealer Law, Article 6686, Vernon's Texas Civil Statutes, Title 43, Texas Administrative Code, are exempt from the requirements of §114.1(c) of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions From Motor Vehicles):

(1) Sales or transfers from one vehicle wholesale dealer to another;

(2) Sales or transfers from a vehicle wholesale dealer to a vehicle retail dealer; and

(3) Sales, transfers, or trade-ins from an individual to a vehicle wholesale or retail dealer.

(f) Federal, state, and local agencies or their agents which sell abandoned, confiscated, or seized vehicles and any commercial vehicle auction facilities are exempt from the provisions of §114.1(c) of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions from Motor Vehicles) if the following conditions are met:

(1) The inspection certificates must be removed from the vehicle and destroyed before the vehicle may be offered for sale or displayed for public examination.

(2) All potential buyers of the vehicle must be informed that deficiencies may be present in the vehicle pollution control systems on the vehicle. The buyer must also be informed of the liabilities to the buyer under §114.1 of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to

Control Emissions from Motor Vehicles) and §114.3 of this title (relating to Inspection Requirements) of operating the vehicle prior to the adequate restoration of all pollution control systems or devices on the vehicle as originally equipped. The seller of the vehicle shall provide to the buyer a written acknowledgement of the receipt of this information which must be signed by the buyer prior to completion of the sales transaction. The seller shall retain a copy of this signed acknowledgement and shall make it available, upon request.

(g) The owner of a motor vehicle which has been totally disabled by accident, age or malfunction and which will no longer be operated is exempt from the provisions of §114.1(c) of this title (relating to Maintenance and Operation of Air Pollution Control Systems or Devices Used to Control Emissions from Motor Vehicles) if the inspection certificate is removed and destroyed before the vehicle is offered for sale or displayed for public examination.

TENNESSEE

to §68-25-115 are authorized to levy noncompliance and nonpayment penalties after appropriate notice and hearing, against any air contaminant source not in final compliance with the applicable Tennessee air pollution control regulations by July 1, 1979. The technical secretary, the board, and the duly exempted local pollution control programs are specifically authorized to accept enforcement responsibility for these civil penalties from the United States Environmental Protection Agency. These penalties are to be equivalent to the economic value a person may realize by a delay in compliance beyond July 1, 1979, including the amount it would have cost the person to comply with all applicable air pollution control regulations had the person chosen to do so. The board will promulgate regulations specifying the procedures to be used in calculating the penalty and providing for quarterly payment of annualized cost. The board, the technical secretary, and the duly exempted local pollution control programs shall consider the matters in §120 of the federal Clean Air Act in their actions. The commissioner, the board, and the duly exempted local pollution control programs are also authorized to file suit for the assessment of the penalties as part of any other civil action brought under this part. The commissioner, the board, and the duly exempted local pollution control programs are authorized to file suit for collection or assessment of the civil penalty, along with other equitable relief pursuant to §68-25-111 in the chancery courts of the county where the pollution is occurring or where the violator or polluter is doing business. The chancery court shall treat a failure to appeal a civil penalty assessment as a confession of judgment by the polluter or violator to the amount of the assessment; and the court is authorized to render judgment and provide for execution of such civil penalties. Such action for civil penalties shall be triable without a jury.

68-25-118.

(a) Any person seeking a variance shall do so by filing a petition for variance with the technical secretary. The technical secretary shall promptly investigate such petition and make recommendation to the board as to the disposition thereof.

(b) Upon receiving the recommendation of the technical secretary, the board may, if such recommendation is for the granting of a variance, do so without hearing. If the recommendation of the technical secretary is against the granting of a variance or the board, in its discretion, concludes that a hearing would be advisable, then a hearing shall be held not later than sixty (60) days after receipt of recommendation of the technical secretary by the board.

(c) The petitioner shall be given written notice at the earliest practicable time as to the time and place of such hearing.

(d) Any member of the board, or, with the approval of the governor, any person licensed to practice law in the state of Tennessee and designated by the board to act as hearing examiner, may act as hearing examiner to conduct hearings, administer oaths, subpoena witnesses, and enforce the attendances of witnesses at the hearing. Any member of the board, the hearing examiner or counsel representing the board may examine or cross-examine all witnesses. A complete record of the hearing shall be made for review by the board members.

(e) All testimony shall be under oath and stenographically recorded. The transcript so recorded shall be made available to the petitioner or any party to the hearing upon payment of the usual charges therefor.

(f) The board in considering the granting of a variance shall give due consideration to the equities of the petitioner and others who may be affected by granting or denial of the petition.

(g) The board may make the granting of a petition for variance contingent upon such other requirements or restrictions on the petitioner as it may deem appropriate and reasonable.

(h) Any variance granted shall be for a period not to exceed one (1) year, but may be extended from time to time but in no case for longer than one (1) year at a time upon recommendation of the technical secretary and affirmative action by the board.

(i) The board shall issue, enter and mail to the petitioner in writing, by certified mail, return receipt requested, within sixty (60) days following the final argument in such hearing or within sixty (60) days following receipt of the recommendation of the technical secretary when no hearing is held, its final order or determination. Such order or determination shall be approved in writing by at least seven (7) members of the board.

(j) Upon failure of the board to issue, enter and mail to the petitioners a final order or determination within sixty (60) days after the final argument in any such hearing or within sixty (60) days following receipt of the recommendation of the technical secretary when no hearing is held, the petitioner shall be entitled to treat for all purposes such failure to act as a granting of the variance requested.

(k) The burden of proof in such hearings shall be upon the petitioner.

Part 2 — Miscellaneous Provisions

68-25-201.

The provisions of this chapter shall not apply to cotton gins.

68-25-202.

(a) Any city, town or county having a population of six hundred thousand (600,000) or more according to the federal census of 1960, or any subsequent federal census, is authorized to enact by its chief legislative body, ordinances, or regulations not less stringent than the provisions of part 1 of this chapter. Violation of any of the ordinances or enactments of the chief legislative body is declared to be a misdemeanor, punishable under the general punishment statute relating to misdemeanors.

(b) Actions taken in accordance with this section shall be conducted in accordance with chapter 18 of title 13 when the action involves a major energy project as defined in §13-18-102.

68-25-203.

(a) This section may be cited as the "Voluntary Inspection and Maintenance Program to Study Emissions from Light Duty Vehicles."

(b) The purpose of this section to obtain improvements in air quality with respect to the levels of photochemical oxidants in the Metropolitan area in and around Davidson County by:

(1) Undertaking a voluntary automobile inspection program to determine the benefit to air quality that could be achieved by reducing emissions from light duty vehicles; and

(2) Collecting data from vehicles belonging to members of the public on a volunteer basis to determine if such vehicles emit excessive amounts of hydrocarbons, nitrogen oxides, and other harmful chemicals.

(c) The Tennessee air pollution control board shall initiate a voluntary inspection and maintenance program to study emissions from light duty vehicles.

(d) The Tennessee air pollution control board shall prepare a detailed and comprehensive report of the findings of the inspection and maintenance program. Such report shall be submitted to the governor and the general assembly.

(e) Implementation of this program is contingent upon availability of federal appropriations and other federal and local funds which may be appropriated for this purpose, in addition to any presently budgeted state funds.

(f) This section shall not apply to farm vehicles including tractors and pickup trucks.

VIRGINIA

VIRGINIA MOTOR VEHICLE EMISSIONS CONTROL LAW

(Code of Virginia, Title 46.2 — Motor Vehicles, Chapter 10, Article 22 — Emissions Inspections; Enacted by Laws of 1980, Ch. 469; Amended by Laws of 1981, Ch. 624; Laws of 1982, Chs. 92, 646; Laws of 1983, Ch. 85; Laws of 1984, Chs. 256, 263; Laws of 1988, Chs. 81, 806; Laws of 1989, Chs. 722, 727)

Administering Agency: State Air Pollution Control Board
Room 801
Ninth Street Office Building
Richmond, Va. 23219

§46.2-1176. Definitions. — The following words and phrases when used in this article shall have the following meanings except where the context clearly indicates a different meaning:

"*Certificate of emissions inspection*" means a device or symbol, as prescribed by the Executive Director, which indicates that a motor vehicle has satisfactorily complied with the emissions standards and passed the emissions inspection pursuant to the provisions of this article.

"*Certificate of emissions inspection waiver*" means a device or symbol, as prescribed by the Executive Director, which indicates that the requirements of compliance with the emissions standards have been waived pursuant to the provisions of this article.

"*Motor vehicle*" means any vehicle which:

1. Is subject to registration in Virginia by the Department of Motor Vehicles;
2. Is designed for the transportation of persons or property;
3. Is more than one year but less than twenty-one years old, measured from the model year of such motor vehicle or, if the motor vehicle does not have a model year, measured from the year of manufacture;
4. Is powered by an internal combustion engine; and
5. Has a gross vehicle weight of 8,500 pounds or less.

The term "motor vehicle" does not include any:

1. Vehicle powered by a diesel engine;
2. Motorcycle;
3. Vehicle which, at the time of its manufacture, was not designed to meet the emissions standards set by the federal government; or
4. Motor vehicle which is either (i) of the same model year as the current calendar year or (ii) less than one year old, measured from the model year of such motor vehicle.

"*Emissions inspection station*" means any official inspection station authorized by the Superintendent to make safety inspections pursuant to §46.2-1163, and which has obtained an emissions inspection station permit from the Board which authorizes the official inspection station and licensed personnel to perform emissions standards inspections in accordance with the provisions of this article.

"*Superintendent*" means the Superintendent of the Department of State Police.

"*Board*" means the State Air Pollution Control Board.

"*Executive Director*" means the Executive Director of the Department of Air Pollution Control.

"*Fleet emissions inspection station*" means any inspection facility operated under a permit issued to a qualified fleet owner or lessee as determined by the Board.

"*Low emissions tune-up*" means the performance of the following procedures on a motor vehicle.

1. Inspection of the choke and its cleaning, repairing or replacing as required.
2. Adjustment of the idle speed and air-fuel mixture according to the manufacturer's specifications.
3. Adjustment of the ignition dwell or gap and ignition timing according to manufacturer's specifications.
4. Inspection of the positive crankcase ventilation valve and vacuum hoses and their repair and replacement as required.
5. Inspection of the spark plugs and spark plug wires and their repair and replacement as may be required.
6. Inspection of the air filter and fuel filter and their replacement as required.
7. Inspection of the distributor and distributor cap and their replacement as required.

§46.2-1177. Emissions inspection program. — The Executive Director shall administer an emissions inspection program. Such program shall require an inspection of motor vehicles at official emission inspection stations in accordance with this article. The emissions inspection program shall provide for biennial motor vehicle inspections at official emissions inspection stations.

§46.2-1178. Administration and scope of emissions inspection program. — The emissions inspection program provided for in this article shall only apply to motor vehicles registered in the Counties of Arlington, Fairfax, and Prince William, and the Cities of Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park.

§46.2-1179. Board to adopt emissions standards. — The Board shall adopt emissions standards necessary to implement the emissions inspection program provided for in this article. Such standards shall require that motor vehicles be required to pass only an idle mode test.

§46.2-1180. Board to adopt regulations; exemption of certain motor vehicles. — The Board is authorized to adopt such regulations for purposes of implementation, administration, regulation, and licensing of personnel as may be necessary to carry out the provisions of this article. Such regulations shall include but not be limited to the following:

1. A system of records maintenance of

Published by THE BUREAU OF NATIONAL AFFAIRS, INC., Washington, D.C. 20037

emissions inspection test results under this article and air pollution control systems or devices under §46.2-1048.

2. A systematic procedure which will provide for emissions inspection stations to calibrate their emission testing equipment so as to ensure conformance with the standards adopted by the Board.

3. A procedure to provide for the establishing of appropriate referee stations in nonattainment areas.

4. A system, consistent with the provisions of §46.2-1182, for the payment and collection of fees permitted for each emissions inspection.

The Board shall adopt regulations which specify the content, methods, procedures, and techniques to be used in the biennial emissions inspection program and shall determine whether this program is being conducted according to those regulations. The Executive Director shall administer these regulations and seek compliance with conditions of any contractual arrangements which the Commonwealth may make for inspection services related to air pollution control.

§46.2-1181. Emissions inspection; cost of repairs; certificates of waiver. — A. A motor vehicle shall qualify for a certificate of emissions inspection waiver in the event that such vehicle has failed an initial inspection and subsequently failed a reinspection if the owner provides written proof that (i) since the initial inspection at least the amount specified below in this section has been spent by the owner on the maintenance and repair of the vehicle's engine and emission control system and related equipment, and (ii) any emission control system or part thereof which has been removed, damaged, or rendered inoperable by any act enumerated in §46.2-1048 has been replaced and restored to operating condition.

B. The Board shall establish and revise, as necessary, specifications and procedures for motor vehicle maintenance, tune-up procedures referred to in this article as low-emission tune-up, and repair of pollution control devices and systems.

C. The cost limitations on repairs under the emissions inspection program, including parts and labor, but excluding costs of repairs covered by warranties shall be:

1. $60 dollars for pre-1972 model vehicles;

2. $125 for 1972 through 1974 model vehicles;

3. $175 for 1975 through 1979 model vehicles; and

4. $200 for 1980 and newer model vehicles.

D. Any certificate of emissions inspection waiver given to any motor vehicle shall be valid for two years. The sale or trade of the vehicle shall not affect the expiration date of the certificate.

§46.2-1182. Emissions inspection fees; exemption. — Each emissions inspection station may charge twelve and one-half dollars for each emissions inspection, but such charge shall not be mandatory. Any such fee shall be paid to the emissions inspection station. At the end of each calendar quarter each official emissions inspection station shall remit to the Board one dollar and ten cents for each emissions inspection approval and each emissions inspection waiver issued by that station under this article during that quarter. Such funds shall be forwarded to the Board to be disposed of pursuant to this section.

Local governments, governmental units and state agencies with their own means of inspection shall be exempt from the payment of fees to the Board under this section.

Notwithstanding the provisions of §2.1-180, all moneys received by the Board from emissions inspection approvals and emissions inspection waivers shall be held by the Board as a special fund for covering the costs of the program. The moneys in this fund are to be appropriated for the purpose of long-term maintenance of air quality and the correction and prevention of nonattainment status for National Ambient Air Quality Standards through air quality programs under the direction of the Executive Director.

§46.2-1183. Frequency of inspection. — No vehicle subject to the provisions of this article shall be registered or reregistered until it has passed an emissions inspection or has been issued a valid certificate of emissions inspection waiver. Such emissions inspection may be performed in conjunction with any state safety inspection required by Article 21 (§46.2-1157 et seq.) of this chapter, provided that such inspection station has been certified by the Board as an official emissions inspection station.

§46.2-1184. Fleet emissions inspection stations; certificates of inspection; dealer's inventory; investigations; revocation of permit. — Any registered owner or lessee of a fleet of at least twenty vehicles may apply to the Board for a permit to establish a fleet emissions inspection station. The Board shall not issue any fleet emissions inspection station permit until it has found that the applicant:

1. Maintains an established place of business for the repair and maintenance of the applicant's fleet of vehicles;

2. Has obtained approved machinery, tools and equipment to adequately conduct the required emissions inspection by using an idle mode test condition;

3. Employs properly trained and licensed personnel to perform the necessary labor; and

4. Agrees to provide test records and data as may be prescribed by the Executive Director.

Any operator of a fleet emissions inspection station under a valid permit shall, upon filing an application in the manner and form prescribed by the Executive Director and paying the prescribed fee, receive a sufficient number of certificate of inspection for each vehicle in the applicant's fleet. No certificate of inspection shall be issued to any fleet vehicle until it has been inspected and found to comply with applicable regulations.

No holder of a fleet emissions inspection station permit shall inspect or certificate any vehicle for which such permittee is not the registered owner or lessee.

§46.2-1185. Investigation of inspection stations; revocation or suspension of permits for emissions inspection stations. — The Executive Director shall investigate the operation of each emissions inspection station and fleet emissions inspection station as the conditions and circumstances of such operation indicate. He may require the holder of any permit to submit such documentation required concerning the operation of such inspection station. The Board may suspend or revoke and require the forfeiture of any emissions inspection station permit and certificates of inspection of such permittee if he finds that such station is not operated in accordance with the provisions of this article and the regulations adopted by the Board or the holder of such permit has failed or refused to submit records or documentation required.

§46.2-1186. False certificate. — No person shall make, issue or knowingly use any imitation or otherwise counterfeit official certificate of emissions inspection or certificate of emissions inspection waiver.

No person shall issue or cause or permit to be issued any certificate of inspection or certificate of waiver knowing it to be fictitious or knowing it to have been issued for another vehicle.

§46.2-1187. Penalties. — Any person violating this article shall be guilty of a Class 3 misdemeanor for the first offense and fined not less than $100 nor more than $1,000 for each subsequent offense except as otherwise provided in this article. If any official emissions inspection station violates this article or regulations of the Board made pursuant hereto, the Board, in addition to or in lieu of such fine imposed by a court, may suspend the appointment of the emissions inspection station or, if int the opinion of the Board, the facts warrant such action, the Board may revoke the authority and cancel the appointment of such inspection station, whether or not the violation is a first offense against this article.

WASHINGTON

WASHINGTON MOTOR VEHICLE EMISSION CONTROL ACT

(Revised Code of Washington, Title 70, Public Health and Safety, Chapter 120—Motor Vehicle Emission Control; Enacted by Washington Laws of the 1st extraordinary session of 1979, Chapter 163; Effective September 1, 1979; Amended by Laws of 1980, Ch. 176; Laws of 1983, Ch. 238; Laws of 1985, Ch.7; Laws of 1987, Ch. 505)

Administering Agency: **Department of Ecology**
P.O. Box 829
Olympia, Washington 98504

70.120.010

Unless the context clearly requires otherwise, the definitions in this section apply throughout this chapter.

(1) "Department" means the department of ecology.

(2) "Director" means the director of the department of ecology.

(3) "Fleet" means a group of twenty-five or more motor vehicles owned or leased concurrently by one person.

(4) "Motor vehicle" means any self-propelled vehicle required to be licensed pursuant to chapter 46.16 RCW.

(5) "Motor vehicle dealer" means a motor vehicle dealer, as defined in RCW 46.70.011, that is licensed pursuant to chapter 46.70 RCW.

(6) "Person" means an individual, firm, public or private corporation, association, partnership, political subdivision of the state, municipality, or governmental agency.

(7) The terms "air contaminant," "air pollution," "air quality standard," "ambient air," "emission," and "emission standard" have the meanings given them in RCW 70.94.030.

[*Editor's note:* Section 17 of Chapter 163 of Laws 1979, Ex.Sess. added the following provision: "This act as it now exists or is hereafter amended shall expire on January 1, 1990, unless extended by law for an additional fixed period of time."]

70.120.020

(1) The department shall conduct the following programs in a manner that will enhance the successful implementation of the air pollution control system established for motor vehicles by this chapter:

(a) A voluntary motor vehicle emissions inspection program;

(b) A public educational program regarding the health effects of air pollution emitted by motor vehicles; the purpose, operation, and effect of emission control devices and systems; and the effect of proper maintenance that of motor vehicle engines has on fuel economy and air pollution emission; and

(c) A public notification program identifying the geographic areas of the state that are designated as being noncompliance areas and emission contributing areas and describing the requirements imposed under this chapter for those areas.

(2)(a) The department, the superintendent of public instruction, and the state board for community college education shall develop cooperatively, after consultation with automotive trades joint apprenticeship committees approved in accordance with RCW 49.04.040, a program for granting certificates of instruction to persons who successfully complete a course of study, under general requirements established by the director, in the maintenance of motor vehicle engines, the use of engine and exhaust analysis equipment, and the repair and maintenance of emission control devices.

(b) The department shall make available to the public a list of those persons who have received certificates of instruction under subsection (2)(a) of this section.

70.120.030

(1) The director shall adopt motor vehicle emission standards. The standards adopted shall ensure that no less than seventy percent of the vehicles tested annually comply with the standards on the first inspection conducted for the vehicles under this chapter each year. The standards shall be adopted as rules in accordance with chapter 34.04 RCW.

(2) The director shall adopt rules for conducting emission tests for motor vehicles.

(3) The director shall adopt air quality standards for air contaminants from the emissions of motor vehicles. The standards shall be adopted as rules and may not be more stringent than those established for the contaminants by the United States environmental protection agency as in effect on September 1, 1979, to implement the federal clean air act.

(4) The director shall adopt, by rule, criteria for calibrating emission testing equipment, including, but not limited to, those identifying standard calibration gas mixtures.

(5) The director shall require that the electronic equipment utilized to test emissions at any station established pursuant to RCW 70.120.040(5) or authorized pursuant to RCW 70.120.080 be properly calibrated.

The department shall examine frequently the calibration of the emission testing equipment used at such stations.

70.120.040

(1) The director shall designate a geographic area as being a "noncompliance area" for motor vehicle emissions if:

(a) Prior to December 31, 1982, analysis of the data recorded at the monitoring sites indicates that an air quality standard established pursuant to this chapter will probably be exceeded after December 31, 1982; or

(b) On or after December 31, 1982, the department's analysis of the data recorded at the monitoring sites indicates that such a standard will probably be exceeded, and if the department determines that the primary source of the contaminant being monitored at the sites is motor vehicle emissions: *Provided*, That the department's analysis may not be based upon data recorded at an air monitoring site for less than one year.

(2)(a) The department shall analyze information regarding the motor vehicle traffic in a noncompliance area to determine the smallest land area within whose boundaries are registered motor vehicles that contribute significantly to the violation of motor vehicle related air quality standards in the noncompliance area. The director shall declare such an area to be an emission contributing area.

(b) An emission contributing area established for a carbon monoxide or oxides of nitrogen noncompliance area must contain the noncompliance area within its boundaries.

(c) An emission contributing area established for an ozone noncompliance area located in this state need not contain the ozone noncompliance area within its boundaries if:

It can be proven that vehicles registered in the area to be declared the emission contributing area contribute significantly to violations of the ozone air quality standard in the noncompliance area.

(d) An emission contributing area may be established in this state for violations of federal air quality standards for ozone in an adjacent state if:

(i) The United States environmental protection agency declares an area to be a nonattainment area for ozone under the provisions of the federal Clean Air Act (42 U.S.C. 7401 et seq.) and the nonattainment area encompasses portions of both Washington and the adjacent state; and (ii) It can be proven that vehicles registered in this state contribute significantly to the violation of the federal air quality standards for ozone in the adjacent state's portion of the nonattainment area.

(3) In establishing the external boundaries of an emission contributing area, the director shall utilize the boundaries established for zip code service areas by the United States postal service.

The director shall designate areas as being noncompliance areas or emission contributing areas, and shall establish the boundaries of such areas, by rule. Notwithstanding the provisions of chapter 34.04 RCW, a rule which would designate such an area or establish or modify the boundary of such an area may not be adopted until it has been submitted to the standing committees on ecology of the house of representatives and the senate for review and approval: *Provided*, That the standing committees shall take into account alternative plans for traffic rerouting and traffic bans that may have been prepared by local municipal corporations for the purpose of satisfying federal emission guidelines.

(4) The department shall administer an emission inspection system for all motor vehicles registered within the boundaries of each such emission contributing area.

(5) The director shall authorize, by contract, one or more individuals, firms, private corporations, associations or partnerships to establish and operate inspection stations for conducting the vehicle emission tests authorized by this chapter: *Provided*, That no person engaged in the inspection of motor vehicles pursuant to subsection (5) of this section shall perform for compensation repairs on any vehicles. No public body may establish or operate such contracted inspection stations. Any such contract shall be let in accordance with the procedures established for competitive bids in chapter 43.19 RCW.

(6) The provisions of subsection (5) of this section apply to inspections conducted pursuant to this section. Those provisions also apply to inspections conducted pursuant to RCW 70.120.020 (1)(a) except when the inspections are conducted for the following purposes:

(a) Auditing;

(b) Contractor evaluation;

(c) Collection of data for establishing calibration and performance standards;

(d) Public information and education; and

(e) Providing a voluntary inspection program if sufficient contractors may not be obtained for the program at a reasonable cost by July 1, 1981.

(7) The fee to be charged for emission inspections conducted pursuant to this section shall be established by the director by rule. The inspection fee shall be a standard fee applicable state-wide or throughout an emission contributing area and shall be no greater than ten dollars. A part on the fee shall be paid to the state and deposited in the general fund.

70.120.050

(1) The director shall review annually the air quality and forecasted air quality of each area in the state designated as a "noncompliance area" for motor vehicle emissions.

(2) If the director determines that:

(a) The air quality standards for contaminants derived from motor vehicle emissions are no longer being violated in the "noncompliance area"; and

(b) Those standards would not be violated in the "noncompliance area" if the emission inspection system established in the emission contributing area for the "noncompliance area" in accordance with RCW 70.120.040(4) were discontinued and the requirements of RCW 46.16.015 no longer applied to the area, the area shall no longer be designated as a "noncompliance area" for motor vehicle emissions.

70.120.060

Before each annual inspection, a person whose motor vehicle is to be inspected at an inspection station authorized by the director under RCW 70.120.040(5) shall pay the inspection fee established under RCW 70.120.040(7). Any person whose motor vehicle is inspected at an inspection station authorized by the director shall receive the results of the inspection test. If the inspected vehicle's emissions comply with the standards established by the director, the person shall receive a dated certificate of compliance. If the inspected vehicle's emissions do not comply with those standards, one reinspection of the vehicle's emissions shall be afforded without charge.

70.120.070

Any person:

(1) Whose motor vehicle is tested pursuant to RCW 70.120.060 and fails to comply with the emission standards established for the vehicle;

(2) Who, following such a test, expends more than fifty dollars for repairs and/or parts solely devoted to meeting the emission standards; and

(3) Whose vehicle is inspected again but again fails, may be issued a certificate of acceptance. To receive the certificate, the person must document the expenditure and the purpose of the expenditure to the satisfaction of the department.

70.120.080

The director may authorize an owner or lessee of a fleet of motor vehicles, or the owner's or lessee's agent, to inspect the vehicles in the fleet and issue certificates of compliance for the vehicles in the fleet if the director determines that: (1) The director's emission and inspection standards will be complied with; and (2) certificates will be issued only to vehicles in the fleet and only when appropriate.

70.120.090 [Repealed]

70.120.100

The department shall investigate complaints received regarding the operation of emission testing stations and shall require corrections or modifications in those operations when deemed necessary.

The department shall also review complaints received regarding the maintenance or repairs secured by owners of motor vehicles for the purpose of complying with the requirements of this chapter. When possible, the department shall assist such owners in determining the merits of the complaints.

70.120.110

Certificates of compliance and acceptance constitute official forms. False statements made thereon or made to secure such certificates are punishable pursuant to RCW 9A.72.040 and the certificates shall bear notice to that effect.

Certificates of compliance and certificates of acceptance may be issued only in the manner authorized by RCW 70.120.060, 70.120.070 and 70.120.080.

70.120.120

The director of the department of ecology shall adopt rules implementing and enforcing RCW 70.120.010 through 70.120.100, 46.16.015(2)(g) and 70.120.110 in accordance with chapter 34.04 RCW. Notwithstanding the provisions of chapter 34.04 RCW, any rule implementing and enforcing RCW 70.120.010 through 70.120.100, 46.16.015(2)(g) and 70.120.110 may not be adopted until it has been submitted to the standing committees on ecology of the house of representatives and senate for review and approval.

70.120.130

The authority granted by this chapter to the director and the department for controlling vehicle emissions is supplementary to the department's authority to control air pollution pursuant to chapter 70.94 RCW.

70.120.140

The department shall establish and maintain in the Washington portion of the Portland-Vancouver metropolitan area not less than three ambient air monitoring devices for ozone, not less than three ambient air monitoring devices for hydrocarbons, and not less than two ambient air monitoring devices for oxides of nitrogen.

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(b) *Hearing.* The hearing shall be a contested case under ch. 227. At the beginning of the hearing the petitioner shall present evidence in support of the allegations made in the petition. Following the hearing the department's action may be affirmed, modified or withdrawn.

(2) Other persons. Any person who is not entitled to seek a hearing under sub. (1) (intro.) and who meets the requirements of s. 227.42(1) may seek review under sub. (1) of any permit, part of a permit, order, decision or determination by the department under ss. 144.391 to 144.402.

(3) Mining hearing. Subsections (1) and (2) do not apply if a hearing on the matter is conducted as a part of a hearing under s. 144.836.

144.404 Machinery use. The department may not require the use of machinery, devices or equipment from a particular supplier or produced by a particular manufacturer, if the required performance standards may be met by machinery, devices or equipment otherwise available.

144.41 Local air pollution control programs. (1) After consultation with incorporated units of local government, any county may establish and thereafter administer within its jurisdiction, including incorporated areas, an air pollution control program which:

(a) Provides by ordinance for requirements compatible with, or stricter or more extensive than those imposed by ss. 144.30 to 144.426 and rules issued thereunder. Such ordinances shall supersede any existing local ordinances;

(b) Provides for the countywide enforcement of such requirements by appropriate administrative and judicial process;

(c) Provides for administrative organization, staff and financial and other resources necessary to effectively and efficiently carry out its program;

(d) May authorize municipalities to participate in the administration and enforcement of air pollution programs; and

(e) Is approved by the department as adequate to meet the requirements of ss. 144.30 to 144.426 and any applicable rules pursuant thereto.

(2) Any county may consult with regional planning commissions and may administer all or part of its air pollution control program in co-operation with one or more other counties or municipalities. Performance by or on behalf of a county pursuant to such co-operative undertaking shall be considered to be performance by the county for purposes of this section.

(3) If the department finds that the location, character or extent of particular concentrations of population, air contaminant sources, the geographic, topographic or meteorological considerations, or any combinations thereof, are such as to make impracticable the maintenance of appropriate levels of air quality without an area-wide air pollution control program, the department may determine the boundaries within which such program is necessary and require it.

(4) (a) If the department has reason to believe that a program in force pursuant to this section is inadequate to prevent and control air pollution in the jurisdiction to which such program relates, or that such program is being administered in a manner inconsistent with the requirements of ss. 144.30 to 144.426, the department shall, on due notice, conduct a hearing on the matter.

(b) If, after such hearing, the department determines that a program is inadequate to prevent and control air pollution in the county to which such program relates, or that such program is not accomplishing the purposes of ss. 144.30 to 144.426, it shall require that necessary corrective measures be taken within a reasonable period of time, not to exceed 60 days.

(c) If the county fails to take such necessary corrective action within the time required, the department shall administer within such county all of the regulatory provisions of ss. 144.30 to 144.426. Such air pollution control program shall supersede all county air pollution regulations, ordinances and requirements in the affected jurisdiction.

(5) Any county in which the department administers its air pollution control program under sub. (4) may, with the approval of the department, resume a county air pollution control program which meets the requirements of sub. (1).

(6) Nothing in ss. 144.30 to 144.426 supersedes the jurisdiction of any county air pollution control program in operation on July 26, 1967, but any such program shall meet all requirements of ss. 144.30 to 144.426 for a county air pollution control program. Any approval required from the department shall be deemed granted unless the department takes specific action to the contrary.

144.42 Motor vehicle emissions limitations; inspections. (1) Definitions. As used in this section, unless the context requires otherwise:

(a) "Federal act" means the federal clean air act, as amended, on May 11, 1980 (42 USC 7401 et seq.) and regulations issued by the federal environmental protection agency under that act.

(b) "Motor vehicle" has the meaning designated under s. 340.01 (35).

(2) Limitations. The department shall adopt rules specifying emissions limitations for all motor vehicles not exempted under sub. (5). The limitations may be different for each size, type and year of vehicle engine affected and may not be more stringent than those required by federal law at the time of the vehicle's manufacture. The limitations shall be adopted and periodically revised upon consideration of the following factors:

(a) The emissions reductions necessary to achieve federally mandated ambient air quality standards not later than December 31, 1987, and to maintain those standards after that date.

(b) The emissions levels attainable by reasonable preventive maintenance practices relating to installed emission control equipment and devices for each model year, size and type of motor vehicle affected.

(c) The requirements for eligibility for a manufacturer's warranty under section 7541 (b) of the federal act.

(3) Counties where inspections required. If the department finds that air quality within a county will not meet one or more applicable primary or secondary ambient air quality standards by December 31, 1982, or that these standards will not be maintained in the county after that date and that inspection of emissions from motor vehicles in any part of the county is required by federal law to attain or maintain these standards, the department shall certify this finding to the department of transportation.

(4) Termination. If the department finds that air quality within a county specified in a certification under sub. (3) has attained all applicable ambient air quality standards and that these standards will be maintained in the county or that control of motor vehicle emissions is no longer required by federal law for attainment and maintenance of these standards, the department shall notify the department of transportation that the county is withdrawn from the certification under sub. (3).

(5) Exemptions. Emissions limitations promulgated under sub. (2) do not apply to the following motor vehicles:

(a) A motor vehicle of a model year more than 15 years old.

(b) A motor vehicle registered at a gross weight exceeding 8,000 pounds.

(c) A motor vehicle exempt from registration under s. 341.05, except that a motor vehicle owned by the United States is not exempt unless it comes under par. (a), (b), (d), (e), (f), (g) or (h).

(d) A motor vehicle powered by diesel fuel.

(e) A new motor vehicle not previously registered in any state.

(f) A motor vehicle for which inspection, in the judgment of the department, is not a cost effective method for attaining and maintaining air quality.

(g) A moped as defined in s. 340.01 (29m).

(h) A motorcycle as defined in s. 340.01 (32).

(6) TAMPERING WITH POLLUTION CONTROL SYSTEM OR MECHANISM. (a) *Definitions.* As used in this subsection:

1. "Air pollution control equipment" means any equipment or feature which constitutes an operational element of the air pollution control system or mechanism of a motor vehicle.

2. [Reserved]

3. "Tamper" means to dismantle, to remove without replacing with an identical or comparable tested replacement device or to cause to be inoperative any air pollution control equipment.

(b) *Prohibition.* Except as permitted or authorized by rule of the department, no person may fail to maintain in good working order or may tamper with air pollution control equipment.

(c) *Ineligibility for motor vehicle registration.* Except as permitted or authorized by rule of the department, if any person tampers with the air pollution control equipment of a motor vehicle, that vehicle is ineligible for motor vehicle registration until the air pollution control equipment is replaced, repaired or restored to good working order.

(d) *Suspension or cancellation of motor vehicle registration.* Except as permitted or authorized by the rule of the department, if the owner of a motor vehicle tampers with or causes or knowingly permits any person to tamper with the air pollution control equipment, the motor vehicle registration for that vehicle may be suspended or canceled in addition to any other penalty provided by law.

(e) *Rule making.* The department shall promulgate rules that specify the requirements for the random inspection of motor vehicles for the occurrence of tampering with air pollution control equipment.

144.423 Violations; enforcement. (1) (a) If the department has reason to believe that a violation of ss. 144.30 to 144.426 or 144.96 or any rule promulgated or special order, plan approval or permit issued under those sections has occurred, it may:

1. Cause written notice to be served upon the alleged violator. The notice shall specify the alleged violation, and contain the findings of fact on which the charge of violation is based. The notice may include an order that necessary corrective action be taken within a reasonable time. This order shall become effective unless, no later than 30 days after the date the notice and order are served, the person named in the notice and order requests in writing a hearing before the department. Upon such request, the department shall after due notice hold a hearing. Instead of an order, the department may require that the alleged violator appear before the department for a hearing at a time and place specified in the notice and answer the charges complained of; or

2. Initiate action under s. 144.426.

(b) If after such hearing the department finds that a violation has occurred, it shall affirm or modify its order previously issued, or issue an appropriate order for the prevention, abatement or control of the problems involved or for the taking of such other corrective action as may be appropriate. If the department finds that no violation has occurred, it shall rescind its order. Any order issued as part of a notice or after hearing may prescribe one or more dates by which necessary action shall be taken in preventing, abating or controlling the violation.

144.424 Emergency procedure. (1) If the secretary finds that a generalized condition of air pollution exists and that it creates an emergency requiring immediate action to protect human health or safety, he or she shall order persons causing or contributing to the air pollution to reduce or discontinue immediately the emission of air contaminants, and such order shall fix a place and time, not later than 24 hours thereafter, for a hearing to be held before the department. Not more than 24 hours after the commencement of such hearing, and without adjournment thereof, the natural resources board shall affirm, modify or set aside the order of the secretary.

(2) In the absence of a generalized condition of air pollution of the type referred to in sub. (1), if the secretary finds that emissions from the operation of one or more air contaminant sources is causing imminent danger to human health or safety, he or she may order the persons responsible for the operations in question to reduce or discontinue emissions immediately, without regard to s. 144.423. In such event, the requirements for hearing and affirmance, modification or setting aside of orders set forth in sub. (1) shall apply.

144.426 Penalties for violations relating to air pollution. Any person who violates ss. 144.30 to 144.426 or any rule promulgated, any permit issued or any special order issued under those sections shall forfeit not less than $10 or more than $25,000 for each violation. Each day of continued violation is a separate offense.

Subchapter IV — Solid Waste Hazardous Waste and Refuse

[See Environment Reporter, State Solid Waste — Land Use — 5, pp. 1351:0101 and 1351:0201]

Subchapter V — Mining [Omitted]

Subchapter VI —

General Environment Provisions [Omitted]

Subchapter VII — General Provisions Enforcement and Penalties

[See Environment Reporter, State Water Laws — 3, p. 951:0101]